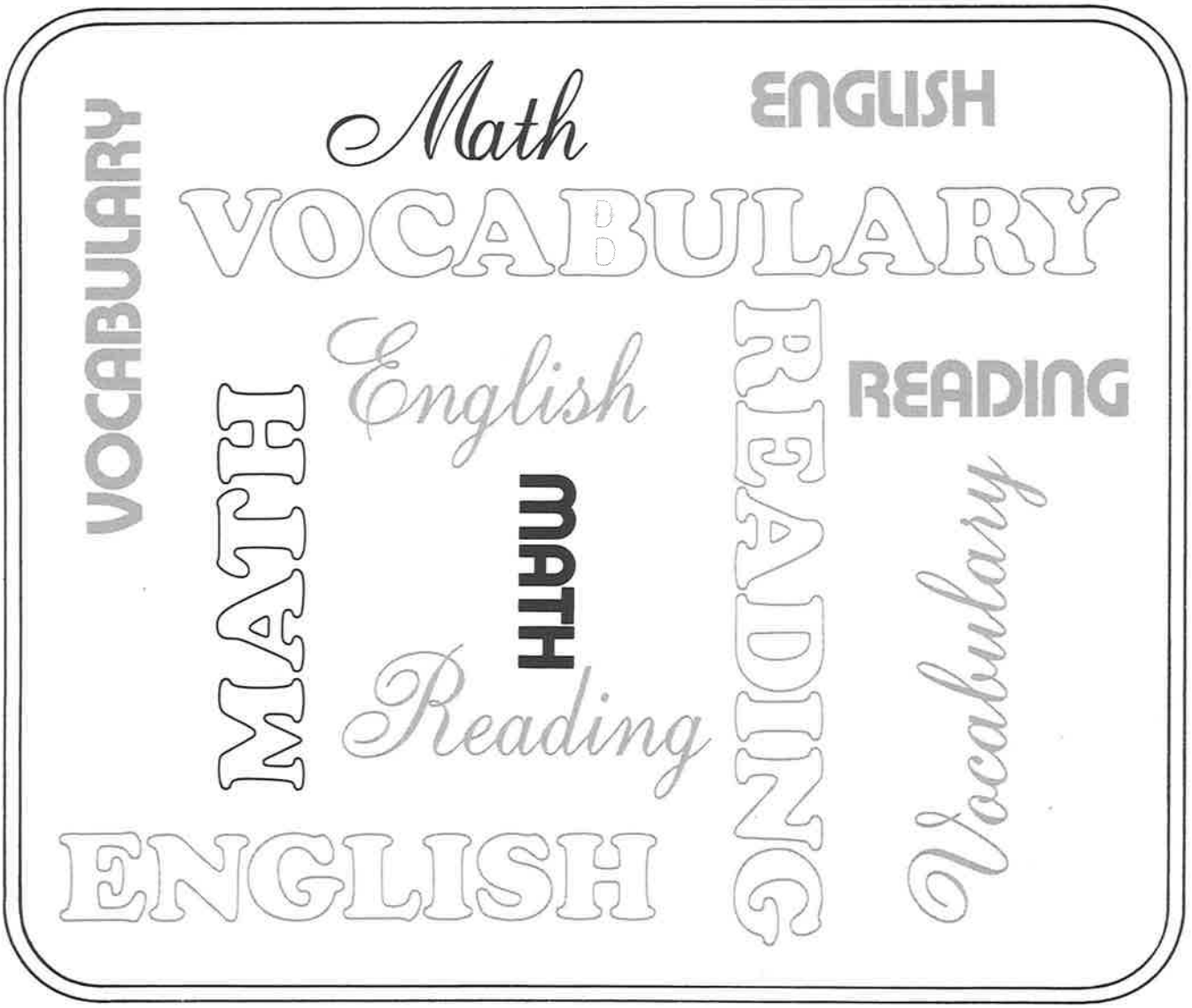
TEACHER'S MANUAL

PART A and B

MATH

35 cumulative units in concepts and skills



THE KIM MARSHALL SERIES

Introduction

About the Program

Math — Part A and *Math — Part B* are a cumulative mathematics curriculum for upper-elementary and middle-school students. The thirty-five units in the two parts cover basic computation skills, Roman numerals, English and metric measurements, graphing, fractions, and basic geometry. The material is presented in language that students understand and use every day. The directions are simple enough to allow students to be self-sufficient much of the time. Theory and generalizations are minimized; practice and application are maximized. Because the program is cumulative, *Part A* should be used before *Part B*. It would be possible however to use the last review test in *Part A* as a pretest for *Part B.* If students pass this test, then *Part B* can be introduced.

Organization

Each of the thirty-five, one-week units covers a specific skill or body of information. There are seven, self-contained workbook pages in each unit. The four "teaching" pages are the meat of each unit. They slowly introduce the material, build the students' mastery of the skill, and prepare them for the unit test. In the middle of each unit, there is a review workpage which briefly goes over information learned previously. At the end of each unit is a cumulative review test covering the major skills learned in all the units up to that point. In summary, each unit contains: workpage 1, workpage 2, review page, workpage 3, workpage 4, unit test, review test.

Sequence

Each unit is a balanced, integrated whole. It is very important for students to move in sequence through the units because they build step by step on the skills learned previously. How you present the material is up to you, but I have found that the best arrangement is to spread the workpages over five days, giving the review page on the third day with workpage 3, and giving the review test on the fifth day with the unit test. Maintaining the overall sequence throughout the thirty-five units is essential to students' success on the cumulative review tests, which are the heart of the program.

Score Boxes, Progress Chart, and Progress Graph

Each page has a two-part box in the top-right corner. The number printed in the lower half of the box is the number of questions on the page; the number of questions the student gets right can be written in the top half of the box after the page is corrected. This gives the student's grade as a fraction. This Teacher's Manual indicates the number of points assigned to each section of the page; this is to aid you in arriving at the total score. The boxes are intended to get students to focus on which problems they got wrong, rather than on a letter grade or percent. However, scores on tests can easily be converted into percents or letter grades if that seems desirable.

In the process of scoring the unit tests and the review tests, you will note that items may contain more than one question. In this case, each problem counts as a fraction of one whole point for the item.

Inside the back cover of each book is an individual progress chart on which to record the unit test scores and the review test scores. Opposite the chart is a progress graph on which to indicate the number of questions right on the review tests. The graph shows the one hundred percent correct level and the eighty percent correct level on each test, so that students filling in the bar graph will see immediately what their mastery level is. I recommend that you involve your students in recording their scores on these charts and in filling in the bar graphs. They then can get a sense of problem areas and of their progress during the year.

Mastery Learning Approach

Since the units in *Math — Part A* and *Math — Part B* build on each other, they are ideally suited to the mastery learning approach developed by Benjamin Bloom at the University of Chicago. In brief Bloom's theory is that if we insist that students achieve mastery of skills before moving along, they will become increasingly successful in subsequent units. Bloom's research indicates that it's not good enough for a student to get a C or a sixty percent on a test. At that level of competence, the student doesn't have sufficient grasp of the skill to use it in future work. Insisting that students score *eighty percent or higher* on the unit tests should make the succeeding units easier for them to learn.

If the charts and graphs are filled in according to this mastery plan, they will give a graphic picture of each student's level of competence and spur students to go back and retake the tests with below-mastery grades. A full box is high mastery, an A; a half box is mastery, eighty percent, or a B; a diagonal line is below mastery, below eighty percent. If students score below mastery, they need individual help from you, a classmate who has learned the material, or some other tutor. Then these students should have a chance to take the test again. Bloom has found that if students are retaught skills in a different way, using a new approach, most of them master the material the second time around. According to Bloom, if we persist with students at this early stage, giving them two or more chances to master basic skills, then teaching these students will get progressively easier as time goes on. They will have both the prerequisite skills and the self-confidence to master future units.

Review Tests

At the end of each unit, except Units 1, 2, and 3 in *Part A*, is a review which covers the skills learned up to that point in the weekly units. The first three units of *Part A* have a practice page instead of a review. However beginning with Unit 4, the sequence of questions on skills is established in a fixed order so that question 1 on the review is always an interval problem, question 2 is always writing words as numbers, question 3 is always a factoring problem, and so on. The purpose of the reviews is to help students retain what they have learned, build mastery of the material, and gain confidence in what they know they can do. The questions are not designed to introduce new material or to trip students up; they are meant to foster student success.

The first review test will be easy for students; they should have no trouble scoring above the mastery level. As the tests get longer and more involved, they become more challenging. However a number of factors keep these tests from becoming too threatening: the sequence is familiar, the earlier skills are repeated, new skills are added gradually, easier questions are interspersed with more difficult ones, and most skills are not tested at their highest level of difficulty. The cumulative nature of the review tests, then, should allow students to score very well on the tests throughout the year.

Note that it is possible for these reviews to become very difficult for students if the groundwork is not carefully laid and feedback is not immediately forthcoming on errors made in each review test. Students who score below mastery level should be taken through their mistakes individually and given extra practice on the items that are giving them trouble. This individual help is vital.

The review tests are not intended to be comprehensive reviews of everything in each unit. After the seventh unit, the review tests contain only one test item for each skill. This regimen puts a premium on accuracy. Students have only one chance to show that they know how to perform each operation. They will be penalized for careless errors by having to do repetitious drill work. The result is that students work more carefully and develop a sense of mastery over the subject matter without hours of tedium. By limiting the number of test items, it is also possible to cover a much broader array of skills. What is needed in the review test is not more drill, but a brief reminder of the essential points covered.

Certain skills that are taught in the units are not picked up in the review tests. In *Part A* this applies to prime factors, English and metric measurement, measurement and time, and graphing. In *Part B* this includes shapes and dimension, and different bases. They are left out of the review tests because there isn't room to test them adequately and still keep the tests compact. Measurement and geometry are

covered in the review workpages, and graphing will be reviewed every week as you have the students fill in the Review Test Progress Graph at the back of the book.

Certain skills are combined with others when there is overlap. For example, question 2 on the review test, writing numbers as words, combines with place value after Unit 7 to become writing numbers to trillions. Question 13 on two-number division of decimals combines with division of decimals after Unit 17 to become two-number division of decimals.

As noted earlier, not all items on the review tests are of equal difficulty. Students can pile up easy points on questions such as 1, 3, 15, 16, 17, and 28, while spending many agonizing minutes on questions 11 and 13. The idea is not to have each question have the same value or take the same amount of time, but rather to establish a familiar sequence and intersperse easy questions with more difficult ones to help students keep up their momentum and make it through the tests.

Suggested Use

I consider *Math — Part A* and *Math — Part B* to be only a part of a good mathematics program. These books should be used in conjunction with a number of other materials and teaching methods, including word problems (especially those involving students' real-world experiences); longer drill exercises in areas where students have difficulty; manipulatives such as chip trading, Dienes blocks, fraction bars; group games involving mental arithmetic; and more challenging mathematical puzzles, brain-teasers, and problems for students with aptitude and interest to pursue them.

The books are ideally suited to fill an entire school year if you choose to use them this way. The pace at which these workbooks are used will depend on the needs of your students. You may find that some students are able to cover the units in a day or two and still maintain a consistently high mastery level on the unit and review tests. There may be other students who need more than one day per page.

For the most part the units are flexible. They can be started on any day of the week; they can be used as class assignments or homework assignments; they can be used for group instruction, individual or small-group work, contracts, or reinforcement drill in conjunction with textbooks or other materials. You might have the whole class go through the units together, or you might have individual students or small groups of students do only the units which a pretest indicates they haven't mastered.

Another possibility is to give the end-of-the-year final review test as a diagnostic test at the beginning of the year to pinpoint students' strengths and weaknesses. Some students would find it quite difficult, but it would give them a clear idea of where they were headed and increase their feeling of competence as they mastered the material over the course of the year.

I hope these books are helpful to you and your students. I'd be delighted to hear any feedback that occurs to you as you use the program. Good luck.

KIM MARSHALL

Unit 1 — Intervals

Page 1 — 47 points

11 points:

1. 8
2. 15
3. 18
4. 24
5. 28
6. 24
7. 25
8. 60
9. 48
10. 52
11. 42

16 points:

12. 27
13. 21
14. 50, 60
15. 10, 12
16. 12, 15
17. 30, 35
18. 45, 54
19. 20, 22
20. 33, 44

20 points:

21. 12, 15, 21, 24, 27, 36, 39, 45, 48, 51
22. 15, 20, 25, 40, 45, 50, 60, 65, 70, 75

Page 2 — 30 points

16 points:

1. 16
2. 18
3. 35
4. 45
5. 100
6. 40, 55
7. 33, 66
8. 24, 36
9. 20, 25
10. 70, 72, 76

13 points:

11. 24, 32, 40, 56
12. 19, 20, 21, 22
13. 30, 40, 50, 60, 70

1 point:

14. A = 18

Page 3 — 15 points

15 points:

1. 510
2. 365
3. 384
4. 752
5. 1,188
6. 3,824
7. 805
8. 136
9. 9,256
10. 7,324
11. 9,117
12. 99,665
13. 13,618
14. 17,625
15. 392

Page 4 — 20 points

16 points:

1. 6, 12, 15
2. 25, 30, 40, 50
3. 10, 11, 12, 13, 14, 16
4. 20, 24, 28

4 points:

5. A = 16
6. A = 56
7. A = 50
8. A = 96

Page 5 — 51 points

25 points:

1. 27, 30
2. 12, 18, 24
3. 14, 35
4. 42, 50
5. 24, 32, 40
6. 35, 45
7. 0, 21, 28
8. 18, 20, 22
9. 20, 30, 40
10. 10, 15

23 points:

11. 14, 28, 35, 49
12. 50, 52, 54, 60
13. 40, 45, 50, 55, 60, 65, 75, 80, 85, 90, 100
14. 12, 15, 21, 27

3 points:

15. A = 24
16. A = 100
17. A = 24

Page 6 — 10 points

1. A = 10
2. A = 30
3. A = 10
4. A = 60
5. A = 56
6. A = 24
7. A = 32
8. A = 24
9. A = 300
10. A = 42

Page 7 — 169 points

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Unit 2 — Writing Numbers as Words

Page 8 — 22 points

16 points:

1. twenty-seven
2. forty-nine
3. eighty-one
4. ninety-eight
5. fifty-three
6. two hundred eleven
7. three hundred eighteen
8. one hundred four
9. six hundred twenty-two
10. nine hundred fourteen
11. two hundred ninety-nine
12. three hundred twenty-five
13. seven hundred eighty-eight
14. three hundred thirteen
15. four hundred seventy
16. nine hundred one

6 points:

17. 562
18. 498
19. 214
20. 412
21. 602
22. 786

Page 9 — 21 points

12 points:

1. three hundred fifty-five
2. two hundred ninety-nine
3. one hundred forty-six
4. eight hundred sixty-four
5. three hundred forty-nine
6. nine hundred ninety-nine
7. five hundred forty
8. five hundred four
9. four hundred fifty
10. one hundred eleven
11. three hundred two
12. eight hundred five

8 points:

13. 725
14. 936
15. 401
16. 366
17. 572
18. 909
19. 919
20. 412

1 point:

21. sixty-one dollars

Page 10 — 19 points

5 points:

1. A = 20
2. A = 18
3. A = 24
4. A = 45
5. A = 24

6 points:

6. 144
7. 144
8. 95
9. 62
10. 48
11. 25

8 points:

12. 5,194
13. 5,550
14. 872
15. 7,714
16. 8,591
17. 2,629
18. 10,491
19. 22,451

Page 11 — 28 points

11 points:

1. eight hundred ninety-five
2. one hundred twenty-three
3. five hundred seventy-nine
4. nine hundred ninety-six
5. eight hundred eighty-five
6. two hundred thirteen
7. three hundred seventeen
8. eight hundred eighteen
9. seven hundred ninety-three
10. two hundred three
11. seven hundred nine

16 points:

12. 759
13. 213
14. 518
15. 580
16. 508
17. 901
18. 119
19. 642
20. 606
21. 859
22. 488
23. 200
24. 613
25. 212
26. 319
27. 290

1 point:

28. two hundred forty-eight dollars.

Page 12 — 28 points

12 points:

1. three hundred ninety-eight
2. two hundred two
3. four hundred three
4. five hundred fourteen
5. nine hundred eighty
6. six hundred sixteen
7. three hundred ninety-two
8. nine hundred twelve
9. two hundred six
10. three hundred sixty-five
11. four hundred fourteen
12. four hundred forty-one

14 points:

13. 313
14. 331
15. 330
16. 501
17. 286
18. 616
19. 761
20. 269
21. 926
22. 629
23. 692
24. 217
25. 818
26. 505

2 points:

27. one hundred fourteen dollars
28. seven hundred ninety-eight students

Page 13 — 20 points

12 points:

1. two hundred forty-six
2. four hundred fifteen
3. two hundred ninety
4. three hundred eighty-six
5. eight hundred ninety-one
6. three hundred fifty-five
7. eight hundred one
8. two hundred twelve
9. five hundred thirteen
10. eight hundred ninety
11. seven hundred six
12. six hundred fourteen

7 points:

13. 379
14. 280
15. 919
16. 724
17. 317
18. 641
19. 214

1 point:

20. six hundred ninety-two dollars

Page 14 — 12 points

9 points:

1. 2,013
2. 13,467
3. 19,881
4. 5,445
5. 5,473
6. 3,118
7. 1,947
8. 21,805
9. 23,888

3 points:

10. A = 30
11. A = 18
12. A = 28

Unit 3 — Factors and Prime Numbers

Page 15 — 29 points

13 points:

1. 2 × 2
2. 2 × 3
3. 2 × 4
4. 3 × 3
5. 2 × 5
6. 2 × 7
7. 3 × 5
8. 3 × 7
9. 2 × 11
10. 5 × 5
11. 2 × 13
12. 3 × 9
13. 3 × 11

16 points:

14. 2 × 6, 3 × 4
15. 2 × 8, 4 × 4
16. 2 × 9, 3 × 6
17. 2 × 10, 4 × 5
18. 2 × 12, 3 × 8, 4 × 6
19. 2 × 14, 4 × 7
20. 2 × 15, 3 × 10, 5 × 6

Page 16 — 44 points

3. 2 × 3
4. prime
5. 2 × 4
6. 3 × 3
7. 2 × 5
8. prime
9. 2 × 6, 3 × 4
10. prime
11. 2 × 7
12. 3 × 5
13. 2 × 8, 4 × 4
14. prime
15. 2 × 9, 3 × 6
16. prime
17. 2 × 10, 4 × 5
18. 3 × 7
19. 2 × 11
20. prime
21. 2 × 12, 3 × 8, 4 × 6
22. 5 × 5
23. 2 × 13
24. 3 × 9
25. 2 × 14, 4 × 7
26. prime
27. 2 × 15, 3 × 10, 5 × 6
28. prime
29. 2 × 16, 4 × 8
30. 3 × 11
31. 2 × 17
32. 5 × 7
33. 2 × 18, 3 × 12, 4 × 9, 6 × 6

Page 17 — 29 points

5 points:

1. A = 17
2. A = 50
3. A = 27
4. A = 32
5. A = 44

6 points:

6. 523
7. 202
8. 870
9. 311
10. 404
11. 608

6 points:

12. six hundred ninety-three
13. three hundred fourteen
14. two hundred ninety-seven
15. eight hundred eighty
16. one hundred twelve
17. seven hundred fifty-four

3 points:

18. = 71
19. = 147
20. = 116

3 points:
21. 68
22. 58
23. 64

3 points:
24. $135.00
25. $25,237.00
26. 2,326 miles

3 points:
27. 4,575
28. 9,161
29. 14,562

Page 18 — 46 points

1. prime
2. 2×2
3. 2×3
4. 2×4
5. 2×5
6. $2 \times 6, 3 \times 4$
7. 2×7
8. $2 \times 8, 4 \times 4$
9. $2 \times 9, 3 \times 6$
10. $2 \times 10, 4 \times 5$
11. 3×7
12. prime
13. $2 \times 12, 3 \times 8, 4 \times 6$
14. 5×5
15. 2×13
16. $2 \times 14, 4 \times 7$
17. $2 \times 15, 3 \times 10, 5 \times 6$
18. $2 \times 16, 4 \times 8$
19. 2×17
20. $2 \times 18, 3 \times 12, 4 \times 9, 6 \times 6$
21. prime
22. 2×19
23. $2 \times 20, 4 \times 10, 5 \times 8$
24. $2 \times 21, 3 \times 14, 6 \times 7$
25. prime
26. $2 \times 22, 4 \times 11$
27. $5 \times 9, 3 \times 15$

Page 19 — 49 points

40 points:
1. prime
2. prime
3. prime
4. 2×4
5. 3×3
6. 2×5
7. prime
8. 2×2
9. 2×3
10. prime
11. prime
12. 3×7
13. prime
14. $2 \times 12, 3 \times 8, 4 \times 6$
15. 5×5
16. 3×9
17. prime
18. $2 \times 15, 3 \times 10, 5 \times 6$
19. prime
20. 3×11
21. 5×7
22. $2 \times 18, 3 \times 12, 4 \times 9, 6 \times 6$
23. prime
24. $2 \times 21, 3 \times 14, 6 \times 7$
25. prime
26. $3 \times 15, 5 \times 9$
27. prime
28. 7×7
29. $2 \times 25, 5 \times 10$

9 points:
30. 5, 7, 17, 19, 23, 31, 37, 43, 51

Page 20 — 33 points

1. 2×3
2. prime
3. 3×3
4. 2×5
5. prime
6. $2 \times 6, 3 \times 4$
7. 2×7
8. 3×5
9. $2 \times 8, 4 \times 4$
10. prime
11. $2 \times 9, 3 \times 6$
12. $2 \times 10, 4 \times 5$
13. 3×7
14. 2×11
15. $2 \times 12, 3 \times 8, 4 \times 6$
16. 5×5
17. 2×13
18. 3×9
19. $2 \times 14, 4 \times 7$
20. prime
21. $2 \times 15, 3 \times 10, 5 \times 6$
22. prime
23. $2 \times 16, 4 \times 8$

Page 21 — 15 points

6 points:

1. 20,783
2. 24,091
3. 4,192
4. 2,609
5. 65,989
6. 32,015

3 points:

7. A = 48
8. A = 48
9. A = 48

3 points:

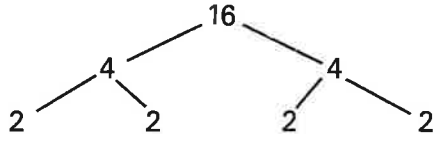
10. seven hundred forty-nine
11. two hundred eighteen
12. six hundred four

3 points:

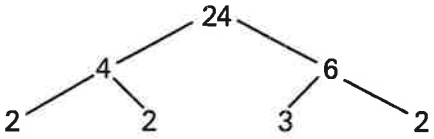
13. 618
14. 902
15. 574

Unit 4 — Prime Factors

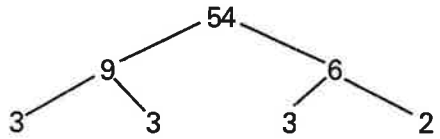
Page 22 — 7 points



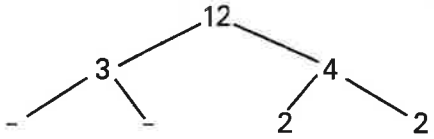
1. Prime factors of 16 = 2 × 2 × 2 × 2



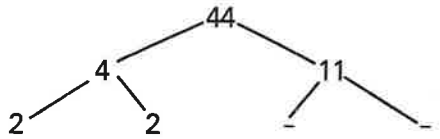
2. Prime factors of 24 = 2 × 2 × 2 × 3



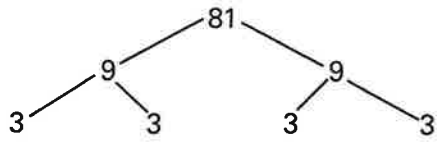
3. Prime factors of 54 = 3 × 3 × 3 × 2

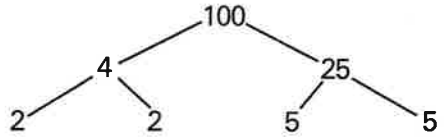


4. Prime factors of 12 = 3 × 2 × 2



5. Prime factors of 44 = 2 × 2 × 11

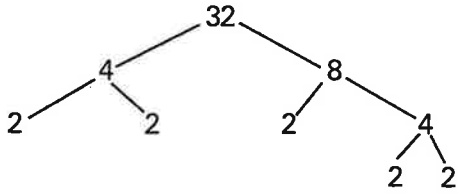


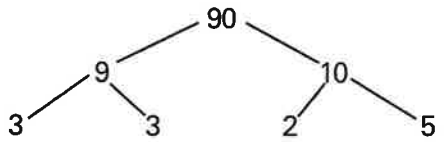


6. Prime factors of 81 = 3 × 3 × 3 × 3

7. Prime factors of 100 = 2 × 2 × 5 × 5

Page 23 — 9 points (correction on the book: 8 points on prime factors and 1 point for the question)

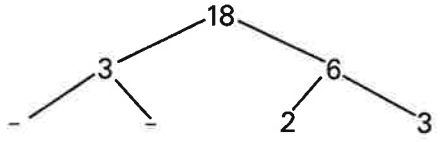


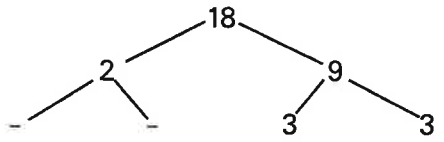


1. Prime factors = 2 × 2 × 2 × 2 × 2

2. Prime factors = 3 × 3 × 2 × 5

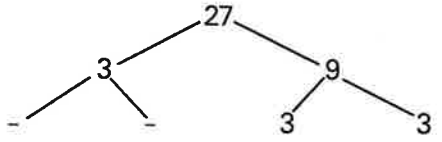
Yes, factors will be the same.

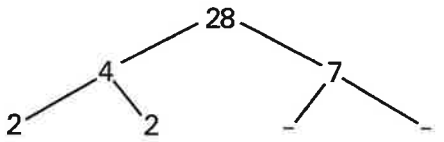




3. Prime factors = 3 × 2 × 3

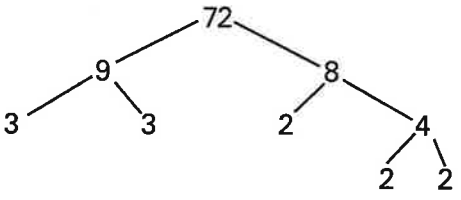
4. Prime factors = 2 × 3 × 3

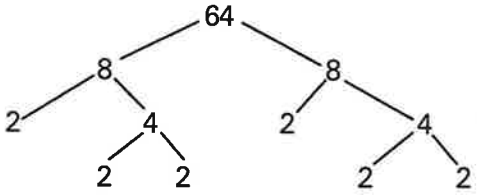




5. Prime factors = 3 × 3 × 3

6. Prime factors = 2 × 2 × 7





7. Prime factors = 3 × 3 × 2 × 2 × 2

8. Prime factors = 2 × 2 × 2 × 2 × 2 × 2

Page 24 — 32 points

4 points:
1. A = 24
2. A = 50
3. A = 21
4. A = 48

6 points:
5. three hundred forty-eight
6. one hundred twelve
7. two hundred seventeen
8. five hundred two
9. eight hundred eighty-eight
10. nine hundred forty-five

6 points:
11. 348
12. 590
13. 409
14. 857
15. 661
16. 700

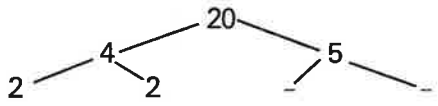
8 points:
17. 2 × 14, 4 × 7
18. 3 × 11
19. 3 × 3
20. 3 × 7
21. prime
22. 4 × 4, 2 × 8

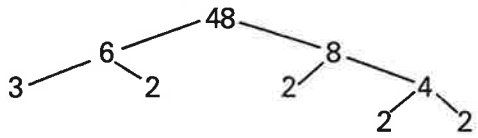
3 points:
23. $210.00
24. 5,472 bricks
25. $4.00

2 points:
26. 194
27. 12

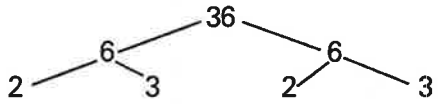
3 points:
28. 6,417
29. 781
30. 13,927

Page 25 — 8 points

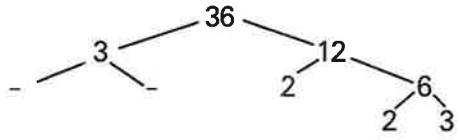




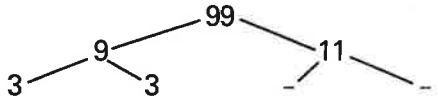
1. Prime factors = 2 × 2 × 5



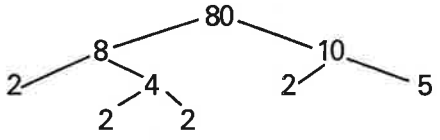
2. Prime factors = 3 × 2 × 2 × 2 × 2



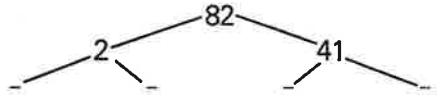
3. Prime factors = 2 × 3 × 2 × 3



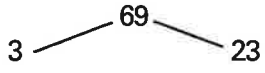
4. Prime factors = 3 × 2 × 2 × 3



5. Prime factors = 3 × 3 × 11



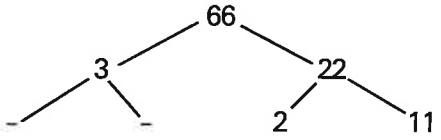
6. Prime factors = 2 × 2 × 2 × 2 × 5



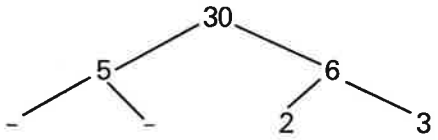
7. Prime factors = 2 × 41

8. Prime factors = 3 × 23

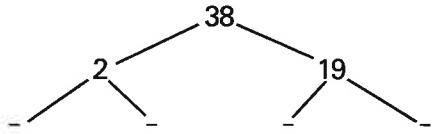
Page 26 — 8 points



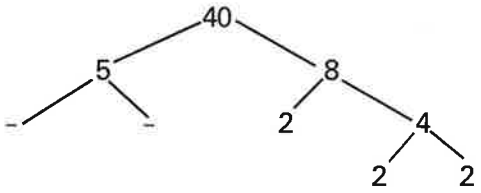
1. Prime factors = 3 × 2 × 11



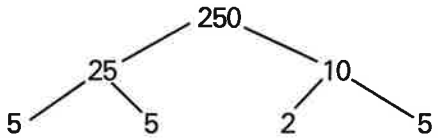
2. Prime factors = 5 × 2 × 3



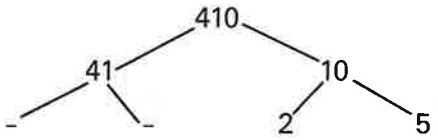
3. Prime factors = 2 × 19



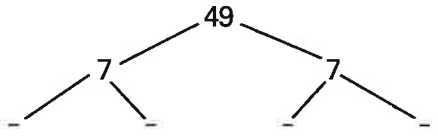
4. Prime factors = 5 × 2 × 2 × 2



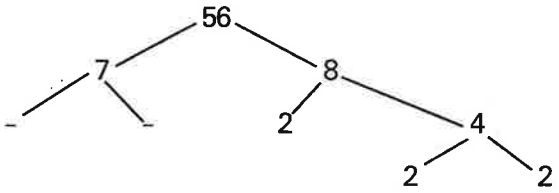
5. Prime factors = 5 × 5 × 2 × 5



6. Prime factors = 41 × 2 × 5

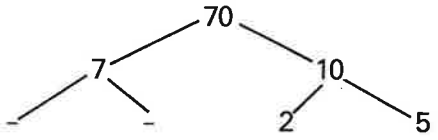


7. Prime factors = 7 × 7

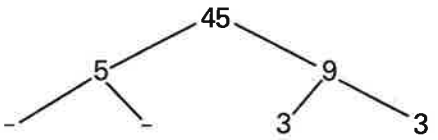


8. Prime factors = 7 × 2 × 2 × 2

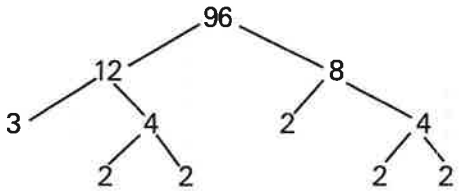
Page 27 — 4 points

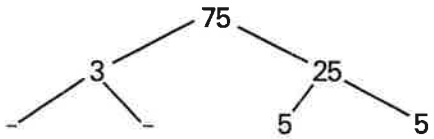


1. Prime factors = 7 × 2 × 5



2. Prime factors = 5 × 3 × 3





3. Prime factors = 3 × 2 × 2 × 2 × 2 × 2 4. Prime factors = 3 × 5 × 5

Page 28 — 3 points

1. A = 18
   A = 60
2. three hundred eight
   649
3. 4 × 5 2 × 10
   3 × 6 2 × 9

Unit 5 — One-Number Division

Page 29 — 7 points

1. $7\overline{)413}$ → 59; −35; 63; −63; 0

2. $4\overline{)252}$ → 63; −24; 12; −12; 0

3. $9\overline{)4716}$ → 524; −45; 21; −18; 36; −36; 0

4. $6\overline{)444}$ → 74; −42; 24; −24; 0

5. $5\overline{)3410}$ → 682; −30; 41; −40; 10; −10; 0

6. $3\overline{)171}$ → 57; −15; 21; −21; 0

7. $4\overline{)3352}$ → 838; −32; 15; −12; 32; −32; 0

Page 30 — 10 points

7 points:

1.
$$\begin{array}{r} 1972 \\ 5\overline{)9860} \\ -5 \\ \hline 48 \\ -45 \\ \hline 36 \\ -35 \\ \hline 10 \\ -10 \\ \hline 0 \end{array}$$

2.
$$\begin{array}{r} 527 \\ 7\overline{)3689} \\ -35 \\ \hline 18 \\ -14 \\ \hline 49 \\ -49 \\ \hline 0 \end{array}$$

3.
$$\begin{array}{r} 281 \\ 6\overline{)1686} \\ -12 \\ \hline 48 \\ -48 \\ \hline 06 \\ -6 \\ \hline 0 \end{array}$$

4.
$$\begin{array}{r} 2572 \\ 4\overline{)10288} \\ -8 \\ \hline 22 \\ -20 \\ \hline 28 \\ -28 \\ \hline 08 \\ -8 \\ \hline 0 \end{array}$$

5.
$$\begin{array}{r} 5274 \\ 9\overline{)47466} \\ -45 \\ \hline 24 \\ -18 \\ \hline 66 \\ -63 \\ \hline 36 \\ -36 \\ \hline 0 \end{array}$$

6.
$$\begin{array}{r} 826 \\ 4\overline{)3304} \\ -32 \\ \hline 10 \\ -8 \\ \hline 24 \\ -24 \\ \hline 0 \end{array}$$

7.
$$\begin{array}{r} 1876 \\ 5\overline{)9380} \\ -5 \\ \hline 43 \\ -40 \\ \hline 38 \\ -35 \\ \hline 30 \\ -30 \\ \hline 0 \end{array}$$

3 points:

8. 534 miles
9. $225.00
10. $361.00

Page 31 — 32 points

4 points:

1. A = 35
2. A = 48
3. A = 14
4. A = 36

5 points:

5. 585
6. 912
7. 450
8. 601
9. 102

5 points:

10. four hundred two
11. two hundred ninety-seven
12. four hundred forty-four
13. three hundred fourteen
14. nine hundred ten

8 points:

15. 2×3
16. 2×11
17. 2×17
18. 3×6, 2×9
19. prime
20. 3×15, 5×9

1 point:

21. 224 miles

2 points:

22. 126
23. 16

7 points:

24. 5,514
25. 1,383
26. 35,804
27. 1,182
28. 2,736
29. 1,961
30. 7,684

Page 32 — 9 points

6 points:

1. $876\frac{3}{4}$

$$\begin{array}{r} 876 \\ 4\overline{)3507} \\ -32 \\ \hline 30 \\ -28 \\ \hline 27 \\ -24 \\ \hline 3 \end{array}$$

2. $1610\frac{1}{3}$

$$\begin{array}{r} 1610 \\ 3\overline{)4831} \\ -3 \\ \hline 18 \\ -18 \\ \hline 03 \\ -\ 3 \\ \hline 01 \\ -\ 0 \\ \hline 1 \end{array}$$

3. $827\frac{5}{8}$

$$\begin{array}{r} 827 \\ 8\overline{)6621} \\ -64 \\ \hline 22 \\ -16 \\ \hline 61 \\ -56 \\ \hline 5 \end{array}$$

4.
$$\begin{array}{r} 106 \\ 9\overline{)954} \\ -9 \\ \hline 05 \\ -00 \\ \hline 54 \\ -54 \\ \hline 0 \end{array}$$

5.
$$\begin{array}{r} 902 \\ 7\overline{)6314} \\ -63 \\ \hline 01 \\ -00 \\ \hline 14 \\ -14 \\ \hline 0 \end{array}$$

6.
$$\begin{array}{r} 8504 \\ 3\overline{)25512} \\ -24 \\ \hline 15 \\ -15 \\ \hline 01 \\ -00 \\ \hline 12 \\ -12 \\ \hline 0 \end{array}$$

3 points:

7. $866.00
8. $5,067.00
9. 126 miles

Page 33 — 11 points

8 points:

1. 1,181	2. 6,024	3. 892	4. 3,601
5. 672	6. 357	7. 1,701	8. 3,641

3 points:

9. $567.00
10. $5,048.00
11. $3.00 (each person got $826.00)

Page 34 — 10 points

8 points:

1. 628	2. $718\frac{4}{5}$	3. 852	4. 6,051
5. 6,304	6. $781\frac{1}{3}$	7. 493	8. 1,273

2 points:

9. 652 miles
10. $843.00

Page 35 — 3 points

1. A = 35
   A = 18
2. six hundred thirty-eight
   357
3. 2 × 12 3 × 8 4 × 6
   2 × 8 4 × 4

Unit 6 — Finding the Average

Page 36 — 7 points

1. 8
2. 12
3. 249
4. 12
5. 30
6. 650
7. 16

Page 37 — 6 points

1. 54
2. 479
3. 33
4. 42
5. 56°
6. 144 pounds

Page 38 — 35 points

3 points:

1. A = 20
2. A = 20
3. A = 42

4 points:

4. nine hundred eight
5. three hundred twelve
6. five hundred ninety-four
7. two hundred forty-eight

4 points:
8. 359
9. 502
10. 911
11. 496

9 points:
12. 2×2
13. prime
14. 2×7
15. 5×5
16. 2×3
17. 2×6, 3×4
18. prime
19. 3×11

6 points:
20. 2×25, 5×10
21. 4×25, 2×50, 5×20, 10×10

1 point:
22. 44

3 points:
23. 259
24. 813
25. 168

2 points:
26. $1093\frac{1}{6}$
27. $9413\frac{6}{8}$ or $9413\frac{3}{4}$

3 points:
28. 405 miles
29. 365 cents ($3.56)
30. 563 mph

Page 39 — 9 points

1. 29
2. 22
3. 25
4. 330
5. 7
6. 150
7. 53¢
8. 36
9. 6 feet

Page 40 — 6 points

1. 8
2. 750
3. 826
4. $26.91
5. 42 points
6. $12,811

Page 41 — 5 points

1. 23
2. 550
3. 16
4. $318
5. 81%

Page 42 — 4 points

1. A = 21, A = 28
2. nine hundred seven
   780
3. 2, 3, 5, 7, 11, 13, 17, 19
4. 886
   604

Unit 7 — Place Value

Page 43 — 18 points

7 points:

1. three hundred one
2. twenty-one
3. nine
4. three hundred fifteen
5. eight
6. four hundred sixty-two
7. six

6 points:

8. fifty-four
9. five
10. twenty-three
11. nine
12. twenty-five
13. two hundred forty-three

5 points:

14. twenty-nine million
15. fifteen billion
16. seventy-one trillion
17. three hundred fifty-one million
18. two hundred twenty-five thousand

Page 44 — 17 points

1 point:

trillions billions millions thousands hundreds tens ones

6 points:

1. three hundred sixty-two
2. seven
3. two
4. nine hundred eighty-three
5. one hundred sixty-four
6. three

4 points:

7. six hundred forty-eight
8. seven
9. nine hundred eighty-one
10. nine

4 points:

11. thirty-five million
12. four hundred twenty-one thousand
13. nine hundred billion
14. three hundred fourteen trillion

2 points:

15. 215,000
16. 19,000,000

Page 45 — 34 points

3 points:

1. 16
2. 23
3. 375

2 points:

4. 1) Add up all the numbers.
   2) Divide the sum by how many numbers there are.

2 points:

5. 168
6. 64

2 points:

7. A = 20
8. A = 45

4 points:

9. 2×50 4×25
   5×20 10×10

6 points:

10. 6,134
11. 824
12. 624
13. $834\frac{2}{5}$
14. $3602\frac{1}{7}$
15. $703\frac{1}{6}$

12 points:

16. 2, 3, 5, 7,
    11, 13, 17, 19,
    23, 29,
    31, 37

3 points:

17. 432 miles
18. No, because their total weight is 993 pounds.
19. $216 for each child

Page 46 — 19 points

1 point:

trillions billions millions thousands hundreds tens ones

7 points:

1. six
2. two hundred fifteen
3. five hundred seventy-two
4. eight hundred thirty-one
5. nine
6. three hundred twelve
7. two

5 points:

8. forty-four million
9. three hundred fifty thousand
10. two hundred eighteen billion
11. eight hundred seventy-five trillion
12. three hundred sixty-seven million

5 points:

13. 24,000,000
14. 538,000
15. 753,000,000
16. 200,000
17. 618,000,000,000,000

1 point:

18. 2,568,943,784,029,105
    seven hundred eighty-four million

Page 47 — 18 points

1 point:

6,394,789,356,012,357

7 points:

1. twelve
2. three hundred fifty-six
3. seven
4. three hundred ninety-four
5. five
6. seven hundred eighty-nine
7. three

5 points:

8. thirty-nine million
9. two hundred fifteen thousand
10. four hundred thirty-seven trillion
11. two hundred ninety-eight billion
12. five hundred one thousand

5 points:

13. 873,000,000
14. 318,000,000,000,000
15. 111,000
16. 25,000,000,000
17. 217,000

Page 48 — 21 points

1 point:

35,821,314,629,297

7 points:

1. nine
2. three hundred fourteen
3. thirty-five
4. seven
5. two
6. six hundred twenty-nine
7. eight hundred twenty-one

4 points:

8. thirty-five thousand
9. two hundred forty-five trillion
10. seven hundred one million
11. eight hundred fifteen billion

8 points:

12. 653,000,000
13. 248,000
14. 900,000,000,000
15. 612,000,000,000,000
16. 19,000
17. 12,000,000
18. 897,000,000,000
19. 75,000,000

1 point:

20. 846,349,219,384,021

Page 49 — 5 points

1. A = 36
   A = 18
2. nine hundred seventeen
   219
3. 3×4, 2×6
   5×6, 2×15 *also* 3×10
4. $572\frac{5}{6}$
   570
5. 47
   154

Unit 8 — Decimal Place Value

Page 50 — 28 points

9 points:

1. three hundredths
2. three thousandths
3. five tenths
4. seven thousandths
5. twelve hundredths
6. twelve ten-thousandths
7. one tenth
8. four hundred-thousandths
9. fifty-five hundredths

9 points:

10. .06
11. .006
12. .02
13. .00007
14. .8
15. .09
16. .0005
17. .17
18. .012

10 points:

19. three ten-thousandths .0003
20. four thousandths .004
21. thirteen hundredths .13
22. nine thousandths .009
23. seven hundredths .07

Page 51 — 37 points

9 points:

1. five thousandths
2. nine tenths
3. nine ten-thousandths
4. seven hundredths
5. one thousandth
6. three tenths
7. eleven hundredths
8. eleven hundred-thousandths
9. eighty-two thousandths

9 points:

10. .02
11. .002
12. .06
13. .12
14. .0012
15. .6
16. .016
17. .45
18. .062

5 points:

19. .04
20. .6
21. .002
22. .00017
23. .9

14 points:

24. eight tenths $\frac{8}{10}$
25. nine hundredths $\frac{9}{100}$
26. seven thousandths $\frac{7}{1000}$
27. eleven hundredths $\frac{11}{100}$
28. eleven thousandths $\frac{11}{1000}$
29. nine hundred thirty-one thousandths $\frac{931}{1000}$
30. seventeen thousandths $\frac{17}{1000}$

Page 52 — 24 points

4 points:
1. fifty-four million
2. twenty-nine trillion
3. three hundred
   one thousand
4. two hundred fifty-four billion

4 points:
5. 17,000,000,000,000
6. 29,000
7. 417,000,000
8. 92,000,000,000

1 point:
9. 34,612,002,499,824,183
   four hundred ninety-nine million

2 points:
10. 106
11. 58

1 point:
12. A = 35

4 points:
13. 6×6 2×18
    3×12 4×9

2 points:
14. 3064
15. $6083\frac{2}{7}$

3 points:
16. 36
17. 31
18. 204

3 points:
19. 271 pounds
20. $376.00
21. $12,009

Page 53 — 27 points

11 points:
1. three and four hundredths
2. one and one thousandth
3. four and nine hundredths
4. two and three thousandths
5. eight and two tenths
6. twelve and two hundredths
7. sixteen and six ten-thousandths
8. eleven and two hundredths
9. six and sixteen thousandths
10. twenty-five and twenty-five hundredths
11. four and fourteen thousandths

8 points:
12. 2.3
13. 6.01
14. 12.1
15. 7.00006
16. 2.02
17. 16.006
18. 2.4
19. 45.016

3 points:
20. 3.0007
21. 4.03
22. 7.014

5 points:
23. $\frac{45}{100}$
24. $\frac{1}{1000}$
25. $\frac{13}{1000}$
26. $\frac{971}{1000}$
27. $\frac{4}{10}$

Page 54 — 30 points

10 points:

1. four and five hundredths
2. three and one thousandth
3. seven and twenty-one hundredths
4. nine and four thousandths
5. twenty-eight and one hundredth
6. nine and eleven hundredths
7. eighty and five thousandths
8. twelve and thirteen thousandths
9. two and sixteen thousandths
10. twenty-six and one thousandth

4 points:

11. $\frac{1}{100}$ 12. $\frac{9}{10}$ 13. $\frac{3}{1000}$ 14. $\frac{137}{1000}$

8 points:

15. 17.6
16. 12.02
17. 6.004
18. 9.63
19. 27.047
20. 54.7
21. 200.06
22. 42.016

8 points:

23. 6.2 24. 4.23 25. 7.002 26. 8.13
27. 12.01 28. 40.002 29. 310.05 30. 51.6

Page 55 — 20 points

8 points:

1. three and one tenth
2. four and two hundredths
3. one and five thousandths
4. twelve and nine hundredths
5. twenty-four and eleven hundredths
6. two and thirty-two thousandths
7. forty and two tenths
8. three and seventeen thousandths

7 points:

9. 6.02
10. 2.4
11. 12.16
12. 64.02
13. 9.014
14. 24.006
15. 99.99

5 points:

16. 2.04
17. 6.023
18. 28.9
19. 3.09
20. 19.019

Page 56 — 5 points

5 points:

1. A = 24
2. seven hundred ninety-four thousand 690,000,000
3. 4×7 2×14
4. $363\frac{5}{7}$
5. 56

Unit 9 — Adding and Subtracting Decimals

Page 57 — 12 points

11 points:

1. $25.61 - 3.21 = 22.40$
2. $296.42 + 5.1 = 301.52$
3. $385.2 + 49.6 = 434.8$
4. $24.64 - 5.23 = 19.41$
5. $854.2 + 35.1 = 889.3$
6. $656.42 - 5.39 = 651.03$
7. $296.3 - 54.4 = 241.9$
8. $289.6 + 38.4 = 328.0$
9. $496.27 + 38.37 = 534.64$
10. $294.65 - 59.1 = 235.55$
11. $5842.6 - 35.9 = 5806.7$

1 point:

12. 708.8 miles

Page 58 — 27 points

8 points:

1. 1.2
2. 3.86
3. 9.80
4. 19.83
5. 84.23
6. 8.99
7. 9.54
8. 2.063

10 points:

9. T
10. F
11. F
12. T
13. F
14. T
15. T
16. T
17. T
18. F

9 points:

19. 5.300
20. 6.4100
21. 8.93500
22. 10.30100
23. 4.0200
24. 5.03900
25. 6.030100
26. 8.64300
27. 9.0200

Page 59 — 27 points

4 points:

1. nine and one tenth
2. one and four thousandths
3. nineteen and twelve thousandths
4. one and twenty-three hundredths

4 points:

5. 2.003
6. 4.11
7. 1.1
8. 5.013

1 point:

9. A = 15

4 points:

10. 2×40 4×20 8×10 5×16

2 points:
11. 6,320
12. $6,084\frac{1}{7}$

2 points:
13. 93
14. 34

4 points:
15. two hundred fifteen million
16. six hundred thirty thousand
17. seven hundred fourteen trillion
18. forty-eight billion

3 points:
19. 12,000,000,000
20. 417,000,000,000,000
21. 203,000,000

3 points:
22. $276
23. $46
24. 2,555 bags a year

Page 60 — 13 points

12 points:

1. $\begin{array}{r} 2.50 \\ -\ 1.48 \\ \hline 1.02 \end{array}$
2. $\begin{array}{r} 3.60 \\ -\ 1.25 \\ \hline 2.35 \end{array}$
3. $\begin{array}{r} 10.30 \\ -\ 4.21 \\ \hline 6.09 \end{array}$
4. $\begin{array}{r} 15.60 \\ -\ 5.29 \\ \hline 10.31 \end{array}$
5. $\begin{array}{r} 24.54 \\ -\ 3.10 \\ \hline 21.44 \end{array}$
6. $\begin{array}{r} 64.28 \\ +\ 3.10 \\ \hline 67.38 \end{array}$
7. $\begin{array}{r} 64.10 \\ -\ 3.28 \\ \hline 60.82 \end{array}$
8. $\begin{array}{r} 56.75 \\ +\ 3.11 \\ \hline 59.86 \end{array}$
9. $\begin{array}{r} 4.020 \\ -\ 3.001 \\ \hline 1.019 \end{array}$
10. $\begin{array}{r} 5.630 \\ -\ 2.002 \\ \hline 3.628 \end{array}$
11. $\begin{array}{r} 5.100 \\ -\ 4.209 \\ \hline .891 \end{array}$
12. $\begin{array}{r} 6.20 \\ -\ 3.44 \\ \hline 2.76 \end{array}$

1 point:
13. $3.70

Page 61 — 19 points

4 points:
4. 21. 310. 4286.

15 points:

1. $\begin{array}{r} 6.0 \\ -\ 3.4 \\ \hline 2.6 \end{array}$
2. $\begin{array}{r} 12.0 \\ -\ 5.2 \\ \hline 6.8 \end{array}$
3. $\begin{array}{r} 35.0 \\ -\ 3.1 \\ \hline 31.9 \end{array}$
4. $\begin{array}{r} 240.0 \\ -\ 5.1 \\ \hline 234.9 \end{array}$
5. $\begin{array}{r} 295.0 \\ -290.4 \\ \hline 4.6 \end{array}$
6. $\begin{array}{r} 56.20 \\ -\ 3.48 \\ \hline 52.72 \end{array}$
7. $\begin{array}{r} 5.48 \\ +\ 3.20 \\ \hline 8.68 \end{array}$
8. $\begin{array}{r} 10.2 \\ -\ 6.0 \\ \hline 4.2 \end{array}$
9. $\begin{array}{r} 51.0 \\ -\ 39.7 \\ \hline 11.3 \end{array}$
10. $\begin{array}{r} 40.0 \\ +30.5 \\ \hline 70.5 \end{array}$
11. $\begin{array}{r} 21.46 \\ -\ 3.111 \\ \hline 18.349 \end{array}$
12. $\begin{array}{r} 25.00 \\ -\ 3.11 \\ \hline 21.89 \end{array}$
13. $\begin{array}{r} 46.00 \\ -\ 2.14 \\ \hline 43.86 \end{array}$
14. $\begin{array}{r} 30.00 \\ -\ 1.01 \\ \hline 28.99 \end{array}$
15. $\begin{array}{r} 25.671 \\ +\ 4.000 \\ \hline 29.671 \end{array}$

Page 62 — 10 points

4 points:

1. 5.42
2. 11.15
3. 406.31
4. 28.51

6 points:

5. $\begin{array}{r} 56.56 \\ +\ 3.42 \\ \hline 59.98 \end{array}$

6. $\begin{array}{r} 249.45 \\ -\ 5.90 \\ \hline 243.55 \end{array}$

7. $\begin{array}{r} 606.06 \\ +\ .60 \\ \hline 606.66 \end{array}$

8. $\begin{array}{r} 29.900 \\ +\ 3.111 \\ \hline 33.011 \end{array}$

9. $\begin{array}{r} 50.0 \\ -\ 3.2 \\ \hline 46.8 \end{array}$

10. $\begin{array}{r} 243.0 \\ -\ .6 \\ \hline 242.4 \end{array}$

Page 63 — 6 points

1. A = 20
2. seventy-eight millon
   two hundred fourteen trillion
   65,000
   906,000,000,000
3. 2 × 20 4 × 10 5 × 8
4. $6036\frac{7}{8}$
5. 18
6. two and three thousandths
   1.13

Unit 10 — Rounding Off Numbers

Page 64 — 35 points

14 points:

1. 60
2. 80
3. 70
4. 80
5. 70
6. 60
7. 80
8. 70
9. 80
10. 70
11. 60
12. 80
13. 80
14. 60

15 points:

15. 50
16. 30 (30 and 40)
17. 90
18. 20
19. 20
20. 50
21. 60
22. 100
23. 90
24. 50
25. 50
26. 90
27. 20

6 points:

28. 100
29. 500 (400 and 500)
30. 800
31. 400

Page 65 — 52 points

50 points:

1. 20
   between 10 and 20
2. 20
3. 90
4. 40
5. 30
6. 20
7. 90
8. 80
9. 40
10. 50
11. 10
12. 100
13. 70
14. 80
15. 700
    between 700 and 800
16. 400
17. 900
18. 300
19. 500
20. 100
21. 900
22. 600
23. 800
24. 400
25. 200
26. 400
27. 300
28. 1000
29. 400
30. 3,000
    between 3,000 and 4,000
31. 5,000
32. 2,000
33. 2,000
34. 4,000
35. 5,000
36. 7,000
37. 5,000
38. 4,000
39. 4,000
40. 3,000
41. 7,000
42. 2,000
43. 12,000
44. 34,000

2 points:

45. $6,000
46. 1,200 eggs

Page 66 — 26 points

6 points:

1. 361.28
2. 133.501
3. 559.182
4. 45.969
5. 11.363
6. 733.471

1 point:

7. A = 26

2 points:

8. eighty-three billion
9. two hundred seven thousand

2 points:

10. 901,000,000,000,000
11. 400,000,000

3 points:

12. 4 × 6 3 × 8 2 × 12

1 point:
13. 5097

1 point:
14. 587

4 points:
15. two and three hundredths
16. seven and one tenth
17. four and five thousandths
18. two and eleven hundredths

2 points:
19. 5.012
20. 1.01

4 points:
21. $71.70
22. 148 mph
23. $353,524,855.00
24. $3090.00

Page 67 — 42 points

30 points:

1. 50
2. 40
3. 50
4. 40
5. 100
6. 40
7. 30
8. 40
9. 30
10. 60
11. 300
12. 400
13. 500
14. 400
15. 400
16. 300
17. 700
18. 300
19. 300
20. 300
21. 4,000,000
22. 7,000,000
23. 7,000,000
24. 2,000,000
25. 7,000,000
26. 3,000,000
27. 5,000,000
28. 3,000,000
29. 1,000,000
30. 24,000,000

12 points:

31. .4
32. .8
33. .6
34. .7
35. .3
36. .7
37. .25
38. .88
39. .58
40. .21
41. .43
42. .36

Page 68 — 42 points

14 points:

1. 20
2. 60
3. 80
4. 80
5. 30
6. 100
7. 70
8. 700
9. 700
10. 400
11. 300
12. 900
13. 400
14. 400

14 points:

15. 8,000
16. 7,000
17. 2,000
18. 7,000
19. 6,000
20. 4,000
21. 4,000
22. .2
23. .7
24. .5
25. .2
26. .8
27. .2
28. .9

12 points:

29. 4,000,000
30. 4,000,000
31. 2,000,000
32. 9,000,000
33. 14,000,000
34. 58,000,000
35. 8,000,000,000
36. 2,000,000,000
37. 4,000,000,000
38. 7,000,000,000
39. 10,000,000,000
40. 1,000,000,000

2 points:

41. 4,000 bushels
42. 210,000,000 people

Page 69 — 33 points

12 points:

1. 20
2. 70
3. 40
4. 40
5. 70
6. 20
7. 800
8. 500
9. 300
10. 1000
11. 800
12. 400

12 points:

13. 5,000
14. 5,000
15. 1,000
16. 9,000
17. 3,000
18. 19,000
19. .3
20. .4
21. .9
22. .5
23. .8
24. .6

8 points:

25. 5,000,000
26. 2,000,000
27. 10,000,000
28. 67,000,000
29. 9,000,000,000
30. 9,000,000,000
31. 7,000,000,000
32. 7,000,000,000

1 point:

33. 24,000,000 people

Page 70 — 8 points

1. A = 22
2. sixty-eight billion
   704,000,000
3. 2 × 28 7 × 8 14 × 4
4. $8034\frac{2}{9}$
5. 301
6. three and five hundredths
   7.011
7. 318.19
8. 2.714

Unit 11 — Two-Number and Three-Number Multiplication

Page 71 — 10 points

8 points:

1. 28,735	2. 28,290	3. 13,376	4. 18,177
5. 24,254	6. 23,606	7. 16,728	8. 84,735

2 points:

9. 1,575
10. $5,136

Page 72 — 12 points

8 points:

1. 9,994	2. 36,668	3. 28,676	4. 27,608
5. 39,585	6. 108,782	7. 63,936	8. 194,532

4 points:

9. 1,392 miles
10. 8,445 miles
11. $5,244
12. 80,270 cars

Page 73 — 34 points

4 points:

1. 5,000
2. 18,000
3. 2,000
4. 67,000

4 points:

5. .48
6. .93
7. .75
8. .43

4 points:

9. .935
10. .667
11. .333
12. .472

2 points:

13. 8
14. 2

1 point:

15. nine hundred twenty billion

1 point:

16. 16,000,000

3 points:

17. 2×12, 3×8, 4×6

1 point:

18. $8034\frac{1}{6}$

1 point:

19. 107

2 points:

20. four and seven hundredths
21. one and eleven thousandths

2 points:

22. 5.001
23. 7.5

5 points:

24. 46.775
25. 90.933
26. 43.73
27. 5.146
28. 12.552

4 points:

29. 56 points
30. $27.85 left
31. $137.00
32. 4,235 miles

Page 74 — 12 points

9 points:

1. 17,928	2. 46,250	3. 19,855	4. 147,066
5. 21,097	6. 147,180	7. 68,915	8. 32,580

4 points:

9. $6,480 per year
10. 156,000
11. $52,500
12. 1,904

Page 75 — 12 points

8 points:

1. 21,097	2. 17,520	3. 140,420	4. 52,101
5. 96,292	6. 813,904	7. 59,112	8. 596,582

4 points:

9. $6,336
10. $4,500
11. 1,752 miles
12. $5,400

Page 76 — 10 points

8 points:

1. 11,970	2. 41,244	3. 15,782	4. 454,092
5. 18,763	6. 29,463	7. 1,637,082	8. 2,566,388

2 points:

9. $3,720
10. $7,644

Page 77 — 10 points

1. A = 36
2. six hundred four million
   25,000,000,000,000
3. 2×15 3×10 5×6
4. $8304\frac{3}{8}$
5. 48
6. nine and five tenths
   7.004
7. 72.891
8. 14.247
9. 8,000,000
10. .54

Unit 12 — Multiplication of Decimals

Page 78 — 16 points

4 points:

1. 12.84	2. 328.5	3. 2.214	4. .2272

10 points:

5. 44.52	6. .1338	7. 34.32	8. .820	9. 1.896
10. 144.8	11. 18.76	12. .3858	13. 74.79	14. 82.8

2 points:

15. $34.80
16. 10.01 ounces

Page 79 — 20 points

5 points:

1. .0274	2. .03858	3. .0856	4. .00405	5. .000584

13 points:

6. .1365	7. 18.87	8. .2568	9. 5.643	10. .0804
11. .00522	12. 42.78	13. .01340	14. 195.6	15. .01226
16. 1.0935	17. 27.584	18. .186702		

2 points:

19. $29.25
20. 189 ounces

Page 80 — 27 points

4 points:

1. 40,641
2. 13,962
3. 282,893
4. 4,384,184

1 point:

5. A = 20

1 point:

6. 947,000

2 points:

7. 7 × 9, 21 × 3

1 point:

8. $7063\frac{1}{8}$

1 point:

9. 76

1 point:

10. seven and four thousandths

1 point:

11. 2.14

2 points:

12. 974.337
13. 56.241

4 points:

14. 62,000,000
15. 29,000,000
16. 62,000,000
17. 207,000,000

4 points:

18. .47
19. .78
20. 1.99
21. 9.74

5 points:

22. 4,500 times an hour
23. $7.25
24. 4,825 pennies
25. 18 miles to a gallon
26. $1088.00

Page 81 — 16 points

13 points:

1. 4.832	2. 157.5	3. 2.564	4. 2.051	5. .154413
6. .0940	7. 3.335	8. 74.48	9. 600.038	10. 1337.22
11. 41.46	12. .00891	13. .02548		

3 points:

14. $21.90
15. $34.65
16. $82.00

Page 82 — 17 points

13 points:

1. 31.05	2. .0849	3. 39.44	4. 3.348	5. 76.850
6. 3.892	7. 553.6	8. .3256	9. 9.9222	10. .112680
11. 4.832	12. .00750	13. .01964		

4 points:

14. $106.65
15. $11.44
16. $6.75
17. 164.4 ounces

Page 83 — 10 points

8 points:

1. 34.70	2. .948	3. 11.611	4. 13.86
5. .0730	6. 212.4	7. .002944	8. 243.145

2 points:

9. $100.48
10. $17.85

Page 84 — 11 points

11 points:

1. A = 10
2. eighty-three thousand
   712,000,000
3. 2 × 45, 3 × 30, 9 × 10
4. $6052\frac{3}{7}$
5. 84
6. seven and six hundredths
   8.011
7. 79.921
8. 68.028
9. 68,000
10. 69
11. 364.78

Unit 13 — Roman Numerals

Page 85 — 26 points

13 points:

1. 13
2. 70
3. 3
4. 6
5. 8
6. 15
7. 31
8. 62
9. 80
10. 200
11. 130
12. 700
13. 226

13 points:

14. XII
15. XXV
16. XXXIII
17. XXVI
18. XXXVIII
19. LXIII
20. CXX
21. CCXXXII
22. CCCLVIII
23. DXXIII
24. DCC
25. DCCCXXXV
26. DCCCLXXXVIII

Pages 86 and 87 — 30 points

8 points:

1. 36
2. 67
3. 215
4. 321
5. 800
6. 655
7. 1222
8. 3328

13 points:

9. XV
10. XXIII
11. LVI
12. LVIII
13. LXIII
14. LXXXVI
15. CXXV
16. CCXXIII
17. DXX
18. DCL
19. DCCCXXI
20. MCC
21. MMMD

4 points:

22. 45
23. 29
24. 90
25. 400

5 points:

26. CDXXXII
27. XLV
28. CMIII
29. LIV
30. XXXIX

Page 88 — 28 points

3 points:
1. 19.205
2. 19590.6
3. 152.32

4 points:
4. $67.95
5. $20.40
6. 146 mph
7. 55¢

1 point:
8. A = 35

1 point:
9. twelve million

1 point:
10. 740,000,000,000

5 points:
11. 3 × 30, 15 × 6, 18 × 5, 2 × 45, 10 × 9

1 point:
12. $2407\frac{1}{9}$

1 point:
13. 16

1 point:
14. six and nine tenths

1 point:
15. 14.12

2 points:
16. 95.463
17. 19.025

2 points:
18. 43,000,000
19. 607,000,000

2 points:
20. .8
21. .9

3 points:
22. 45
23. 501
24. 460

Page 89 — 38 points

21 points:
1. 1
2. 5
3. 10
4. 50
5. 100
6. 500
7. 1,000
8. 27
9. 68
10. 80
11. 111
12. 815
13. 601
14. 400
15. 900
16. 229
17. 2,713
18. 1,422
19. 74
20. 969
21. 3,888

14 points:
22. XXVII
23. LXXXIII
24. XC
25. XLIII
26. XLIV
27. XLIX
28. LXI
29. CXXVIII
30. CCXLVIII
31. CDI
32. DLVII
33. DCCXXIV
34. MCCCXXVIII
35. MMMCCXV

3 points:
36. 1938
37. 1854
38. 1968

Page 90 — 39 points

21 points:

1. 1
2. 5
3. 10
4. 50
5. 100
6. 500
7. 1,000
8. 21
9. 43
10. 29
11. 76
12. 84
13. 213
14. 327
15. 720
16. 476
17. 801
18. 1,728
19. 3,123
20. 943
21. 994

15 points:

22. XXXV
23. LXXXIII
24. LI
25. XLV
26. LXXXVIII
27. CLXXXIX
28. CXXXIV
29. DLV
30. CCCLXXXIX
31. DCXXXVII
32. DCCCLXXIV
33. MCCXXXI
34. MDLXXIII
35. MDCCCXL
36. MMMCDXXIX

3 points:

37. Born in 163 and died in 241.
38. 1832

Page 91 — 25 points

11 points:

1. 26
2. 63
3. 48
4. 117
5. 90
6. 363
7. 426
8. 924
9. 2,315
10. 1,929
11. 3,788

11 points:

12. XXXVII
13. XLI
14. LXXXIII
15. CXXV
16. CCXLVIII
17. CCCXXIX
18. DI
19. DCCXXXIII
20. MDCCXXXVIII
21. MMMCMXLIX
22. MMDXV

3 points:

23. 1923
24. 1719
25. MCMLXXXII

Page 92 — 11 points

11 points:

1. A = 27
2. twenty trillion 685,000,000
3. 2×30, 6×10, 5×12, *also* 15×4, 3×20
4. $5207\frac{1}{4}$

5. 350
6. seven and fifteen hundredths
   9.006
7. 473.45
8. 23.084
9. 79,000,000
10. .644
11. 347.592

Unit 14 — Two-Number Division

Page 93 — 11 points

5 points:

115
138
161
184
207

3 points:

4. 35 mph
5. $684.00
6. 65 bags each

3 points:

1. 362
2. 718
3. 605

Page 94 — 16 points

9 points:

47
94
141
188
235
282
329
376
423

2 points:

6. 134 times a minute
7. $248 per week

5 points:

1. 672
2. 359
3. 804
4. 167
5. 2164

Page 95 — 30 points

5 points:

1. 867
2. 2,642
3. 924
4. 2,489
5. 2,748

5 points:

6. MMCCCXXXIV
7. MCMXXVII
8. MDCLXXI
9. MMMCDXXV
10. MMMDCCCLXXXVIII

1 point:
11. A = 32

1 point:
12. seventy-seven million

1 point:
13. 900,000,000,000,000

1 point:
14. 7×11

1 point:
15. $6024\frac{2}{3}$

1 point:
16. 44

1 point:
17. nine and seven hundredths

1 point:
18. 17.012

2 points:
19. 79.937
20. 23.068

1 point:
21. 78,000

2 points:
22. .48
23. .54

2 points:
24. 80
25. 26

2 points:
26. 15.865
27. 1164.94

3 points:
28. $16.55
29. 91 years
30. $48.00

Page 96 — 19 points

9 points:
56
112
168
224
280
336
392
448
504

3 points:
1. 492
2. 705
3. 63

2 points:
39
78

3 points:
4. 852
5. 146
6. 963

2 points:
7. $265.00 a year
8. $234.00 a week

Page 97 — 9 points

6 points:
1. 645
2. 937
3. 803
4. 186
5. 684
6. 756

3 points:
7. $103 each payment
8. 5,280 feet a minute
   Yes, one mile.

Page 98 — 5 points

4 points:

1. 735
2. 604
3. 167
4. 4,639

1 point:

5. 15 hours

Page 99 — 12 points

12 points:

1. A = 35
2. nine hundred two billion 53,000,000
3. 5 × 11
4. 6,027
5. 51
6. four and three tenths 9.015
7. 84.362
8. 14.172
9. 35,000,000
10. .6
11. 9.823
12. 2,762 MMMCDXXVIII

Unit 15 — English and Metric Measurements

Page 100 — 24 points

24 points:

	English	Metric
1.	in	cm
2.	mi	km
3.	in	cm
4.	in	cm
5.	ft	m
6.	in	mm
7.	2 in	50 mm
8.	3 ft	1 m
9.	1000 mi	1600 km
10.	1 in	2 cm
11.	100 yd	90 m
12.	10 in	25 cm

Page 101 — 34 points

18 points:

English	Metric
1. gal	l
2. cup *or* oz	ml
3. gal	l
4. oz	ml
5. gal	l
6. 1 oz	6 ml
7. 16 oz	500 ml
8. 20 gals	80 l
9. 8 oz	240 ml

16 points:

English	Metric
10. oz *or* cup	ml
11. gal	l
12. cup	ml
13. mi	km
14. oz	ml
15. gal	l
16. yd	m
17. oz	ml

Page 102 and 103 — 32 points

13 points:

53
106
159
212
265
318
371
424
477

1. 372
2. 816
3. 409
4. 24

1 point:

5. seven hundred four million

1 point:

6. 91,000,000,000,000

1 point:

7. sixteen and four thousandths

1 point:

8. 12.17

1 point:

9. 2 × 17

1 point:

10. 202

2 points:

11. 61.193
12. 25.241

1 point:

13. 709,000

1 point:

14. .773

1 point:

15. 74

1 point:

16. 80.66

1 point:

17. 2,846

1 point:

18. MMMCDXXXVIII

5 points:

19. 1,893
20. 1,452 miles each hour
21. 4,356 miles
22. 35.36 pounds
23. 6,545 times

Page 104 — 32 points

16 points:

English	Metric
1. tn	kg
2. oz	g
3. lb	kg
4. oz	mg
5. lb	kg
6. 25 lb	12 kg
7. 130 lb	59 kg
8. 1 oz	30 g

16 points:

English	Metric
9. lb	kg
10. oz	ml
11. tn	kg
12. oz	mg
13. in	cm
14. ft	cm
15. gal	l
16. lb	kg

Page 105 — 30 points

16 points:

English	Metric
1. yd	m
2. oz	ml
3. in	mm
4. tn	kg
5. 2 cups	500 ml
6. 22 yd	20 m
7. 2 lb	1 kg
8. 25 yd	23m

14 points:

English	Metric
9. oz	mg
10. gal	l
11. yd	m
12. fl oz	ml
13. tn	kg
14. oz	g
15. in	cm

Page 106 — 26 points

26 points:

DISTANCE

English	Metric
1. inch	5. millimeter
2. foot	6. centimeter
3. yard	7. meter
4. mile	8. kilometer

VOLUME

English	Metric
9. ounce	14 milliliter
10. cup	15. liter
11. pint	
12. quart	
13. gallon	

WEIGHT

English	Metric
16. ounce	19. milligram
17. pound	20. gram
18. ton	21. kilogram

22. kilograms
23. millimeters
24. pounds
25. miles
26. gallons

Page 107 — 13 points

13 points:

1. A = 20
2. two hundred seventeen thousand
   49,000,000,000,000
3. 2 × 25, 5 × 10
4. $3027\frac{7}{9}$
5. 344
6. seven and six hundredths
   14.012
7. 154.53
8. 35.327
9. 67,000
10. .48
11. 46.7061
12. 1,977
    MMDCLXXIV
13. 249

Unit 16 — Measurement and Time

Page 108 — 19 points

19 points:

2. 400
3. 10, 60
4. 365, 1,095
5. 25, 150
6. 10, 70
7. 100, 300
8. 7, 35
9. 31
10. 30
11. 7
12. 10
13. 100
14. 30

Page 109 — 28 points

28 points:

1. 16, 112
2. 60, 240
3. 2,000, 18,000
4. 4, 40
5. 7, 35
6. 100, 2,000
7. 5,280, 15,840
8. 365, 1,825
9. 3, 900
10. 10, 40
11. 31
12. 30
13. 30
14. 31
15. 31
16. 30
17. 29, 28

Page 110 and 111 — 33 points

12 points:

1. miles
2. kilometers
3. inches
4. centimeters
5. ounce
6. milliliter
7. gallons
8. liters
9. ton
10. kilogram
11. ounces
12. grams

1 point:
13. four hundred seven billion

1 point:
14. 94,000,000,000,000

1 point:
15. A = 42

2 points:
16. 3 × 33, 9 × 11

1 point:
17. 48

1 point:
18. three and five hundredths

1 point:
19. 16.012

2 points:
20. 32.59
21. 7.223

1 point:
22. 78,000,000,000

1 point:
23. .78

2 points:
24. 18
25. 98

1 point:
26. 81.54

1 point:
27. 2467

1 point:
28. MMMCDXLIX

2 points:
29. 307
30. 539

2 points:
31. $160.04
32. 92

Page 112 — 30 points

20 points:

1. 3
2. 3
3. 5
4. 4
5. 2
6. 6
7. 6
8. 5
9. 4
10. 8
11. 9
12. 7
13. 2
14. 5
15. 18
16. 30
17. 31
18. 30
19. 31
20. 31

10 points:

21. 1, 3
22. 1, 3
23. 1, 13
24. 1, 12
25. 3, 2

Page 113 — 57 points

24 points:

1. 12
2. 3
3. 5,280
4. 16
5. 2,000
6. 2
7. 2
8. 4
9. 60
10. 60
11. 24
12. 7
13. 365
14. 10
15. 100
16. 5
17. 10
18. 25
19. 50
20. 100
21. 30, 31, 28, 29

20 points:

22. 16,000
23. 3
24. 15
25. 5
26. 6
27. 4
28. 1,095
29. 31,680
30. 10
31. 20
32. 4
33. 2,920
34. 4
35. 360
36. 180
37. 7
38. 30
39. 31
40. 30
41. 28

13 points:

42. 2, 1
43. 2, 1
44. 2, 13
45. 4, 1
46. 4, 2, 8
47. 1, 35

Page 114 — 54 points

24 points:

1. 12
2. 3
3. 5,280
4. 16
5. 2,000
6. 2
7. 2
8. 4
9. 60
10. 60
11. 24
12. 7
13. 365
14. 10
15. 100
16. 5
17. 10
18. 25
19. 50
20. 100
21. 30
    31
    28, 29

20 points:

22. 6,000
23. 500
24. 64
25. 35
26. 30
27. 12,000
28. 8
29. 300
30. 63
31. 96
32. 21,120
33. 180
34. 1,825
35. 125
36. 800
37. 72
38. 30
39. 31
40. 31
41. 30

10 points:

42. 1, 5
43. 2, 12
44. 1, 235
45. 2, 1
46. 2, 2

Page 115 — 13 points

13 points:

1. A = 40
2. ninety-seven million
   500,000
3. 2 × 20, 4 × 10, 5 × 8
4. $6205\frac{3}{8}$
5. 7
6. twelve and seventeen thousandths
   4.01
7. 709.6
8. 15.111
9. 27,000,000,000
10. 49
11. 209.56
12. 3,643
    MMCCCLXVIII
13. 347

Unit 17 — Division of Decimals

Page 116 — 14 points

1. 75.1	2. 80.6	3. .243	
4. 64.2	5. 86.4	6. 3.74	
7. 7.28	8. 64.2	9. 57.2	10. .951
11. .59	12. 37.	13. 8.3	14. .37

Page 117 — 12 points

1. .681	2. 6.84	3. 68.4	
4. 3.54	5. 84.2	6. 842.	
7. 8.53	8. 44.3	9. 305.	10. 7.53
11. 6.72	12. 45.9		

Page 118 and 119 — 41 points

23 points:
1. kilograms
2. centimeter
3. milliliter
4. 12
5. 3
6. 5,280
7. 16
8. 2,000
9. 2
10. 2
11. 4
12. 60
13. 60
14. 24
15. 365
16. 366
17. 10
18. 100
19. 31
20. 30
21. 31
22. 29, 28

1 point:
23. A = 14

1 point:
24. three hundred five thousand

1 point:
25. 200,000,000,000,000

3 points:
26. 7 × 6, 14 × 3, 21 × 2

1 point:
27. 39

1 point:
28. sixteen and two thousandths

1 point:
29. 5.11

2 points:
30. 82.908
31. 33.185

1 point:
32. 79,000

1 point:
33. 6.3

1 point:
34. 1,480

1 point:
35. 6.345

1 point:
36. MMMCMXXXIII

2 points:
37. 19 days
38. $27.72

Page 120 — 13 points

13 points:

1. 7530.
2. .807
3. .0649
4. 6.85
5. .756
6. 84.2
7. .84
8. 6.82
9. 5.96
10. 6570.
11. 1.9
12. 30.8
13. 9.71

Page 121 — 8 points

6 points:

1. 86.31
2. 49.4
3. 58.3
4. 72.
5. 26.7
6. 6340.

2 points:

7. 25 candy bars
8. $1.25 each

Page 122 — 10 points

9 points:

1. 65.7
2. 84.1
3. 350.
4. 3.84
5. 6.82
6. 76.3
7. 4260.
8. 35.1
9. .672

1 point:

10. 64 candy bars

Page 123 — 13 points

13 points:

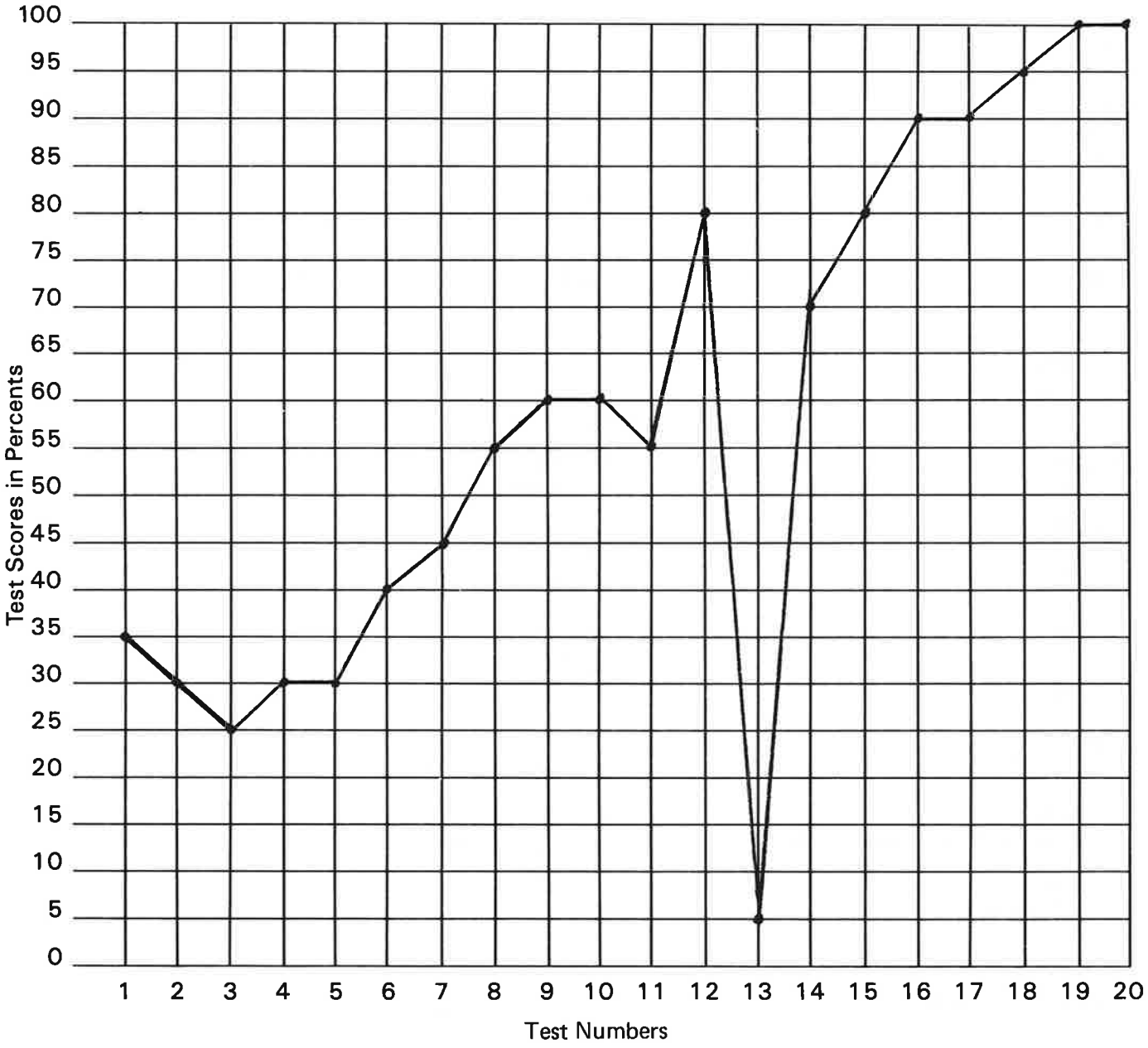
1. A = 54
2. two hundred eighteen trillion 909,000,000
3. 7×5
4. $6053\frac{1}{3}$
5. 84
6. eight and twelve hundredths 15.007
7. 45.107
8. 6.125
9. 27,000
10. .78
11. 127.71
12. 2,869 MMMCDXXVII
13. 62.7

Unit 18 — Graphing

Page 124 — 9 points

1. 70°
2. Feb., Dec.
3. July
4. March
5. June, Sept.
6. March
7. Teacher corrrected; answers will vary.

Page 125 — 17 points



Page 126 and 127 — 38 points

13 points:
67
134
201
268
335
402
469
536
603
1. 52.4
2. .193
3. 4060
4. .972

8 points:
5. 31
6. 30
7. 2,000
8. 365
9. 16
10. 60
11. 4
12. 12

1 point:
13. A = 36

1 point:
14. four hundred nineteen million

1 point:
15. 17,000,000,000

2 points:
16. 3 × 6, 2 × 9

1 point:
17. 37

1 point:
18. nineteen and three thousandths

1 point:
19. 2.9

2 points:
20. 56.077
21. 41.769

1 point:
22. 68,000,000

1 point
23. .428

2 points:
24. 1,600
25. 2,077

1 point:
26. MMMCDXXIX

2 points:
27. 215.90 pounds
28. 1779

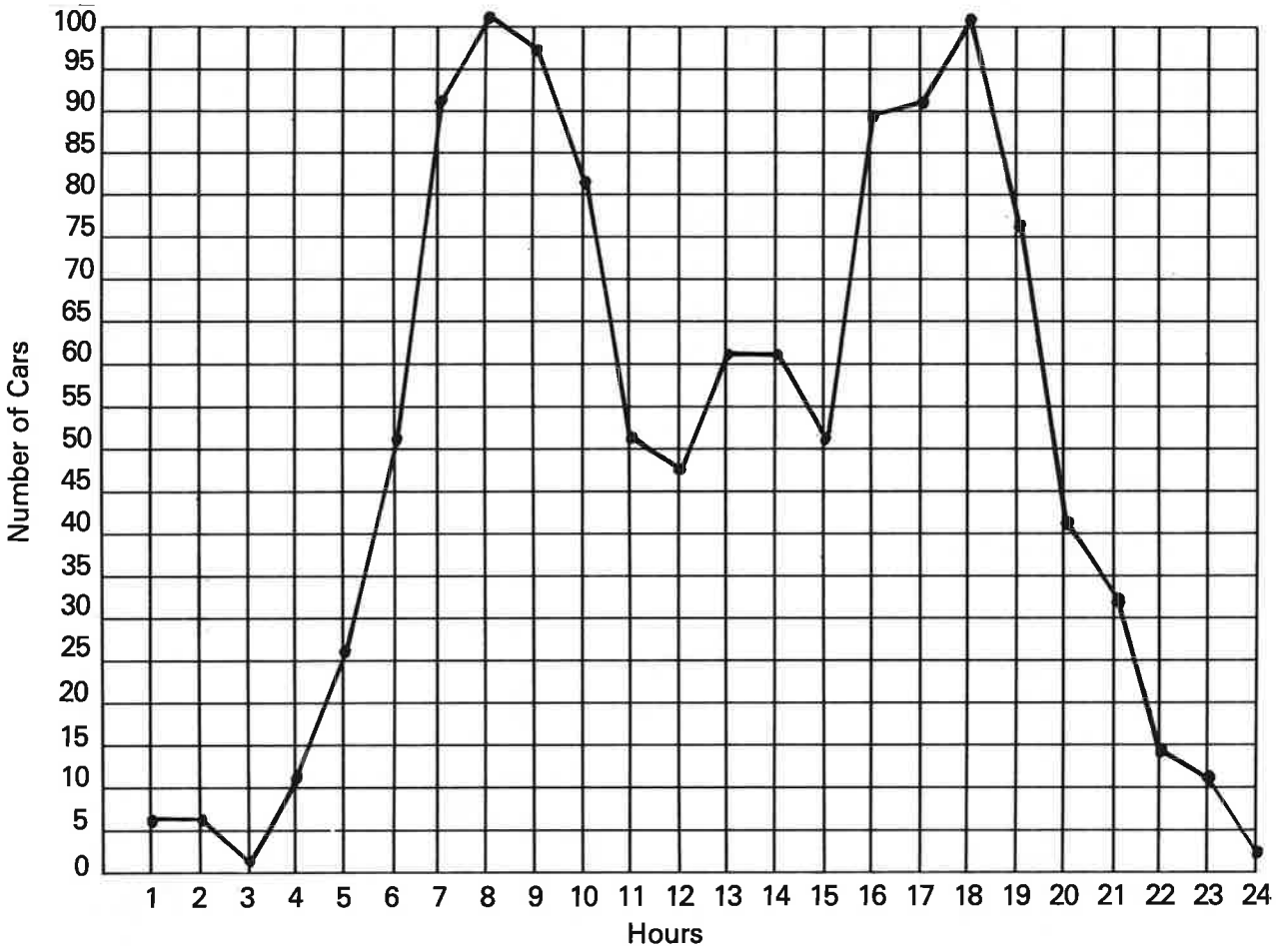
Page 128 — 30 points

2 points for numbering the axes of the graph.
17 points for filling in the graph.

11 points:
1. 12
2. 10
3. 9
4. 2, 18
5. 7, 8, 9, 10
6. 11
7. Teacher corrected; answers will vary.

Page 130 — 33 points

2 points for labeling the axes on the graph.
24 points for filling in the lines on the graph.



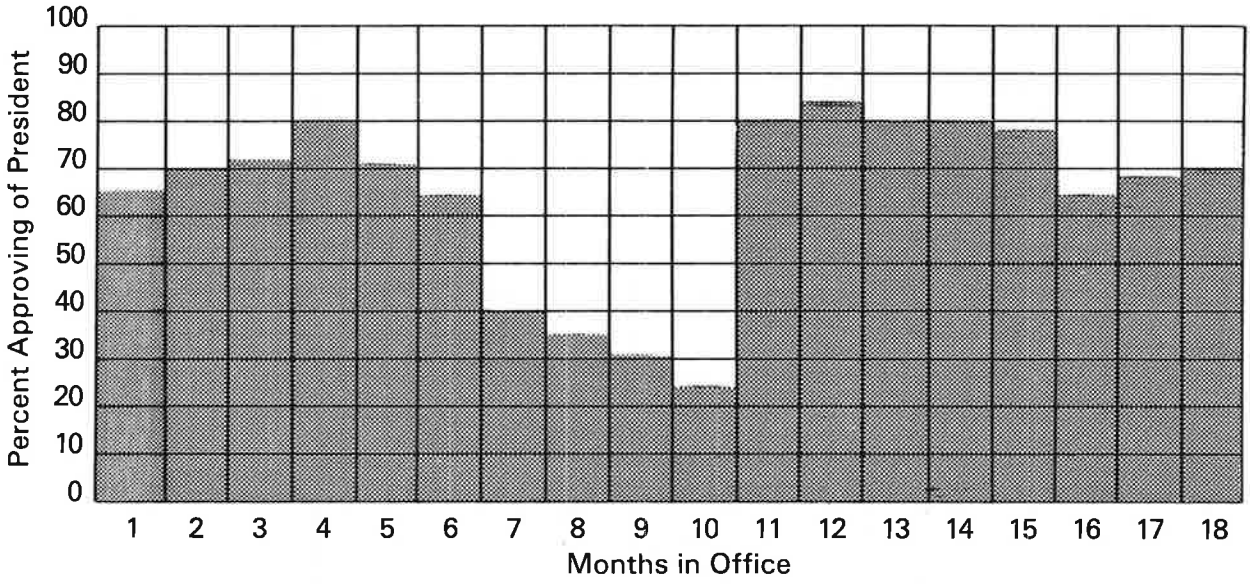
7 points:

1. 8, 18
2. 3
3. 50
4. 7, 17
5. 6-7
6. Teacher corrected; answers will vary. (There's a lot of commuter traffic over the bridge; it is probably near or in a city.)

Page 131 — 13 points

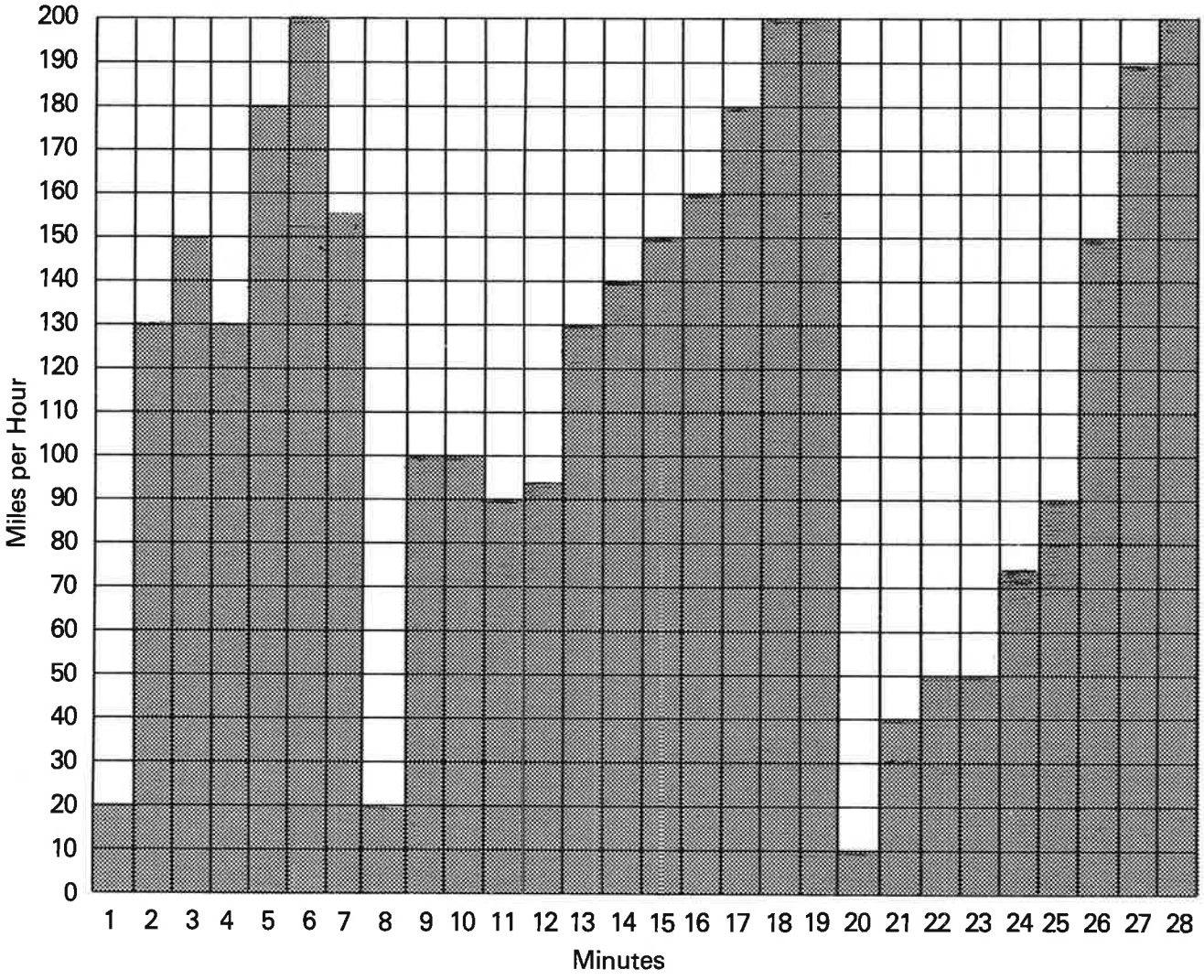
13 points:

1. A = 31
2. five hundred one million
   60,000,000,000,000
3. 2 × 35, 7 × 10, *also* 14 × 5
4. $8305\frac{2}{9}$
5. 379
6. four and two tenths
   5.01
7. 95.35
8. 9.227
9. 36,000,000
10. .643
11. 291.15
12. 1342
    MMDCCCLXIII
13. 68.3



Page 129 — 30 points

2 points for labeling the axes on the graph.
28 points for filling in the bars on the graph.



Page 1 - 48 points

Unit 19 — Exponents 1

48

Exponents are a short way of multiplying numbers by themselves. The little number written above the big one tells you how many times to write the big number and how many times to multiply it by itself. The little number is called the *exponent*.

Example:

3^2 means that you should write the 3 two times and multiply: $3 \times 3 = 9$.

5^3 means that you should write the 5 three times and multiply: $5 \times 5 \times 5 = 125$.

Different exponents are read in different ways. Examples of how to read and do exponents are given in the chart below.

Study the examples and then fill in the rest of the chart.

48 points:

	Exponent	How you read it	How many times you multiply	Answer
	3^2	three squared	3×3	9
	3^3	three cubed	$3 \times 3 \times 3$	27
1.	3^4	three to the fourth	3 x 3 x 3 x 3	81
2.	3^5	three to the fifth	3 x 3 x 3 x 3 x 3	243
3.	3^6	three to the sixth	3 x 3 x 3 x 3 x 3 x 3	729
4.	4^2	four squared	4 x 4	16
5.	5^3	five cubed	5 x 5 x 5	125
6.	9^2	nine squared	9 x 9	81
7.	10^2	ten squared	10 x 10	100
8.	5^4	five to the fourth	5 x 5 x 5 x 5	625
9.	8^2	eight squared	8 x 8	64
10.	11^2	eleven squared	11 x 11	121
11.	2^2	two squared	2 x 2	4
12.	2^5	two to the fifth	2 x 2 x 2 x 2 x 2	32
13.	9^3	nine cubed	9 x 9 x 9	729
14.	6^3	six cubed	6 x 6 x 6	216
15.	2^7	two to the seventh	2 x 2 x 2 x 2 x 2 x 2 x 2	128
16.	8^3	eight cubed	8 x 8 x 8	512
17.	2^3	two cubed	2 x 2 x 2	8

Page 2 — 66 points

Exponents 2

66

Remember:
With a little ^{2} you say *squared*.
With a little ^{3} you say *cubed*.
With a little ^{4} you say to the *fourth*.
With a little ^{5} you say to the *fifth*.

Fill in all of the chart below.
66 points:

	Exponent	How you read it	How many times you multiply	Answer
1.	4^2	four squared	4 x 4	16
2.	3^3	three cubed	3 x 3 x 3	27
3.	2^4	two to the fourth	2 x 2 x 2 x 2	16
4.	5^2	five squared	5 x 5	25
5.	6^3	six cubed	6 x 6 x 6	216
6.	9^2	nine squared	9 x 9	81
7.	4^5	four to the fifth	4 x 4 x 4 x 4 x 4	1024
8.	2^7	two to the seventh	2 x 2 x 2 x 2 x 2 x 2 x 2	128
9.	7^2	seven squared	7 x 7	49
10.	2^3	two cubed	2 x 2 x 2	8
11.	3^6	three to the sixth	3 x 3 x 3 x 3 x 3 x 3	729
12.	12^2	twelve squared	12 x 12	144
13.	8^2	eight squared	8 x 8	64
14.	9^3	nine cubed	9 x 9 x 9	729
15.	4^4	four to the fourth	4 x 4 x 4 x 4	256
16.	7^3	seven cubed	7 x 7 x 7	343
17.	2^6	two to the sixth	2 x 2 x 2 x 2 x 2 x 2	64
18.	8^3	eight cubed	8 x 8 x 8	512
19.	3^4	three to the fourth	3 x 3 x 3 x 3	81
20.*	9^2	nine squared	9 x 9	81
21.	3^2	three squared	3 x 3	9
22.	6^2	six squared	6 x 6	36

* Also : 3^4 three to the fourth 3 x 3 x 3 x 3

Pages 3 and 4 — 34 points

Review 19

34

In each unit there will be a Review mixed in with the regular work pages. These Reviews are cumulative, so that they will give you the chance to practice what you learned in *Math — Part A* and all the things you learn in *Part B*. This way you won't forget the material.

Put the decimal in the right place in the answer to each problem below.
4 points:

1. 6.41 / 93.1) 596.771
2. 3.754 / 619) 466.726
3. .706 / .203) 1.43318
4. 2 050. / .143) 293.150

Find the interval, and then figure out what *A* is on the following number lines.
2 points:

5. 18 — A — 54
   A = 27
6. 21 — A — 30
   A = 24

3 points:
7. Factor 24 three ways. 3 x 8, 4 x 6, 2 x 12

1 point:
8. Write 911,000,000,000,000 in words.
   Nine hundred eleven trillion

2 points
9. 32297 ÷ 8 = 4037 1/8
10. 4559.5 ÷ 5 = 911.9

1 point:
11. Find the average of 12, 21, and 15.
    16

3 points:
12. 23.7 − 14.631 = 9.069
13. 91.905 + 74.3 = 166.205
14. 21.7 × .45 = 9.765

2 points:
15. Write four and eleven thousandths in numbers.
    4.011

16. Write 18.03 in words.
    eighteen and three hundredths

1 point.
17. Round off 47.83151 to the nearest one.
    48.

1 point:
18. 177.52 ÷ 2.8 = 63.4

1 point:
19. Write MMCDXXXIV in Arabic numbers.
    2,434

2 points:
20. A group of 5 friends went to the movies and spent $6.25 to get in. How much did each ticket cost?
    $1.25

21. A toll collector at the end of the Pennsylvania Turnpike collects $1.35 from each car. How much will he get from 96 cars?
    $129.60

6 points:
22. Circle the best metric measure for measuring the weight of a horse.
    milligram
    gram
    (kilogram)

23. What is the best metric measure for measuring the weight of a grain of sugar?
    milligram

24. Circle the best metric measure for measuring the width of a postage stamp.
    millimeter
    (centimeter)
    meter
    kilometer

25. What is the best metric measure for measuring the length of a house?
    meter

5 points:

26. Circle the best metric measure for measuring the liquid in a Coke can.
(milliliter)
liter

27. What is the best metric measure for measuring the water in a bathtub?
liter

28. How many days are in May? 31

29. How many days are in April? 30

30. How many quarts are in a gallon? 4

31. How many days are in a leap year? 366

32. How many quarters are in a dollar? 4

Page 5 - 44 points

Exponents 3

44

39 points:

Fill in all of the chart below.

	Exponent	How you read it	How many times you multiply	Answer
1.	9^3	nine cubed	9 x 9 x 9	729
2.	4^4	four to the fourth	4 x 4 x 4 x 4	256
3.	10^2	ten squared	10 x 10	100
4.	3^5	three to the fifth	3 x 3 x 3 x 3 x 3	243
5.	2^8	two to the eighth	2 x 2 x 2 x 2 x 2 x 2 x 2 x 2	256
6.	6^3	six cubed	6 x 6 x 6	216
7.	2^4	two to the fourth	2 x 2 x 2 x 2	16
8.	8^3	eight cubed	8 x 8 x 8	512
9.	9^3	nine cubed	9 x 9 x 9	729
10.	12^2	twelve squared	12 x 12	144
11.	7^2	seven squared	7 x 7	49
12.	5^2	five squared	5 x 5	25
13.	8^2 (or) 4^3	eight squared (or) four to the third	8 x 8 / 4 x 4 x 4	64

Now work out the following problems. First work out each exponent; then add or subtract.

5 points:

14. $2^2 + 4^2 =$ 4 + 16 = 20

15. $9^2 + 2^3 =$ 81 + 8 = 89

16. $5^3 + 6^2 =$ 125 + 36 = 161

17. $4^3 + 8^2 =$ 64 + 64 = 128

18. $2^4 - 3^2 =$ 16 - 9 = 7

Page 6 — 35 points

Exponents 4

35

30 points:

Fill in all of the chart below.

	Exponent	How you read it	How many times you multiply	Answer
1.	4^3	four cubed	4 x 4 x 4	64
2.	5^2	five squared	5 x 5	25
3.	2^8	two to the eighth	2 x 2 x 2 x 2 x 2 x 2 x 2 x 2	256
4.	3^4	three to the fourth	3 x 3 x 3 x 3	81
5.	9^3	nine cubed	9 x 9 x 9	729
6.	6^2	six squared	6 x 6	36
7.	10^2	ten squared	10 x 10	100
8.	5^3	five cubed	5 x 5 x 5	125
9.	10^3	ten cubed	10 x 10 x 10	1000
10.	2^4	two to the fourth	2 x 2 x 2 x 2	16

5 points:

Now work out the following problems. First work out each exponent; then add or subtract.

11. $3^3 + 4^2 =$ 27 + 16 = 43
12. $12^2 - 2^3 =$ 144 - 8 = 136
13. $6^2 + 2^2 + 3^2 =$ 36 + 4 + 9 = 49
14. $2^5 - 1^9 =$ 32 - 1 = 31
15. $8^3 + 9^2 =$ 512 + 81 = 593

Page 7 - 20 points

Test 19 — Exponents

20

4 points:

Use words to write each of the following numbers and exponents.

1. 4^3 four cubed
2. 8^2 eight squared
3. 5^4 five to the fourth
4. 6^7 six to the seventh

3 points:

Write the following words as numbers with exponents. You don't have to work out the answers.

5. four squared = 4^2
6. nine cubed = 9^3
7. two to the fifth = 2^5

13 points:

Work out the following problems.

8. $4^3 =$ 64
9. $6^3 =$ 216
10. $7^2 =$ 49
11. $4^4 =$ 256
12. $9^2 =$ 81
13. $2^5 =$ 32
14. $8^3 =$ 512
15. nine squared + five cubed = 81 + 125 = 206
16. six cubed + four squared = 216 + 16 = 232
17. $8^2 + 7^2 =$ 64 + 49 = 113
18. $3^4 + 2^3 =$ 81 + 8 = 89
19. $10^2 + 12^2 =$ 100 + 144 = 244
20. $2^6 + 10^3 =$ 64 + 1000 = 1064

Page 8 — 13 points

Review Test 19

13

Since this is *Math — Part B*, this Review Test is the sixteenth out of thirty-two tests which appear at the end of each unit. The tests go over the skills you have learned in previous weeks. The idea is to test you on new skills as you learn them and also to give you practice on the old ones. This way, by the end of the year, you should be good at all the skills you've learned and practiced in *Part A* and *Part B*.

Each skill will always be the same question number; for instance, question two will always be on writing numbers as words. As the tests get longer during the year, you will find the questions at the beginning easier and easier because you will have had so much practice on them. If you do get a question wrong, be sure to check it over and understand your mistake. That way you will get it right on the next test you take.

13 points:

1. Find the interval, and then figure out what *A* is on the following number line.

A = 21

2. Write 305,000 in words.

three hundred five thousand

Write twenty-seven billion in numbers.

27,000,000,000

3. Factor 24 three ways. 4 x 6

2 x 12 3 x 8

4. 24778 ÷ 8 = 3097 1/4

5. Find the average of 17, 23, 46, and 30.

29

6. Write 7.017 in words.

seven and seventeen thousandths

Write two and seven hundredths in decimals.

2.07

7. 35 + 8.91 + 7.397 = 51.307

8. 125.4 − 67.157 = 58.243

9. Round off 35,568,241 to the nearest million.

36,000,000

10. Round off .4287459 to the nearest tenth.

.4

11. 6.49 × 5.7 = 36.993

12. Write MMCDLXXIV as an Arabic number.

2,474

Write 3,721 in Roman numerals.

MMMDCCXXI

13. 224.70 ÷ 3.5 = 64.2

Page 9 — 31 points

Unit 20 — Introduction to Fractions 1

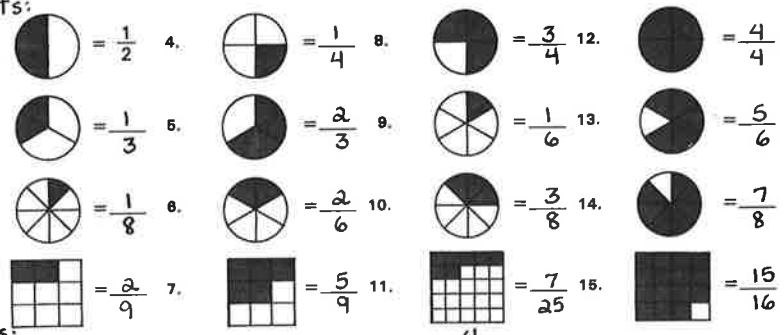
31

A *fraction* is part of a whole thing, like $\frac{1}{2}$ a pie or $\frac{3}{4}$ of a dollar. The top number (the *numerator*) tells how many pieces you have. The bottom number (the *denominator*) tells how many pieces there are in one whole thing if it is divided into parts.

Put fractions next to each circle or square below. Make your fraction show the number of shaded parts over the total number of parts in each circle or square.

Example:

15 points:



4 points:

16. Which of the above fractions is equal to one whole? 4/4

17. Circle the following fractions which are equal to one whole.

$\frac{5}{6}$ $\frac{7}{7}$ $\frac{8}{11}$ $\frac{2}{3}$ $\frac{6}{6}$ $\frac{9}{9}$ $\frac{5}{7}$

If the denominators (bottoms) are the same, adding and subtracting fractions is easy. Just leave the denominator the same and add or subtract the numerators (tops).

Try the following problems.

Example: $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

11 points

18. $\frac{9}{10} - \frac{5}{10} = \frac{4}{10}$

19. $\frac{6}{11} + \frac{4}{11} = \frac{10}{11}$

20. $\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$

21. $\frac{3}{9} + \frac{4}{9} = \frac{7}{9}$

22. $\frac{5}{6} - \frac{4}{6} = \frac{1}{6}$

23. $\frac{4}{8} + \frac{3}{8} = \frac{7}{8}$

24. $\frac{2}{7} + \frac{5}{7} = \frac{7}{7}$

25. $\frac{9}{14} + \frac{4}{14} = \frac{13}{14}$

26. $\frac{2}{13} - \frac{1}{13} = \frac{1}{13}$

27. $\frac{7}{8} - \frac{5}{8} = \frac{2}{8} = \frac{1}{4}$

28. $\frac{6}{19} + \frac{4}{19} = \frac{10}{19}$

1 point:

29. Which of the answers above is equal to one whole? 7/7

Page 10 — 45 points

Introduction to Fractions 2

45

Next to each circle, write the fraction which shows the number of shaded parts and the total number of parts in that circle.

Example:

9 points:

 = $\frac{1}{2}$ 2.  = $\frac{1}{4}$ 4.  = $\frac{3}{4}$ 6.  = $\frac{1}{8}$ 8.  = $\frac{3}{8}$

1.  = $\frac{1}{3}$ 3.  = $\frac{3}{3}$ 5.  = $\frac{1}{6}$ 7.  = $\frac{6}{6}$ 9.  = $\frac{4}{4}$ or $\frac{1}{1}$

3 points:

10. Which three of the fractions above are equal to one whole? $\frac{3}{3}$ $\frac{6}{6}$ $\frac{4}{4}$ or $\frac{1}{1}$

20 points:

Now shade in the following circles. Look at the fractions to decide how many parts to shade in.

11. $\frac{1}{2}$ 
15. $\frac{2}{2}$ 
19. $\frac{1}{3}$ 
23. $\frac{2}{3}$ 
27. $\frac{3}{3}$ 

12. $\frac{1}{4}$ 
16. $\frac{2}{4}$ 
20. $\frac{3}{4}$ 
24. $\frac{4}{4}$ 
28. $\frac{1}{6}$ 

13. $\frac{2}{6}$ 
17. $\frac{3}{6}$ 
21. $\frac{4}{6}$ 
25. $\frac{5}{6}$ 
29. $\frac{6}{6}$ 

14. $\frac{1}{8}$ 
18. $\frac{2}{8}$ 
22. $\frac{3}{8}$ 
26. $\frac{4}{8}$ 
30. $\frac{8}{8}$ 

5 points:

31. Which of the fractions above are equal to one whole?

$\frac{2}{2}$ $\frac{4}{4}$ $\frac{3}{3}$ $\frac{6}{6}$ $\frac{8}{8}$

8 points:

Now work out the following problems. Remember to leave the denominators the same.

32. $\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$ 34. $\frac{2}{11} + \frac{5}{11} = \frac{7}{11}$ 36. $\frac{6}{8} + \frac{1}{8} = \frac{7}{8}$ 38. $\frac{2}{3} + \frac{1}{3} = \frac{3}{3}$

33. $\frac{4}{8} - \frac{3}{8} = \frac{1}{8}$ 35. $\frac{6}{7} - \frac{4}{7} = \frac{2}{7}$ 37. $\frac{9}{10} - \frac{5}{10} = \frac{4}{10}$ 39. $\frac{2}{13} + \frac{7}{13} = \frac{9}{13}$

Page 11 — 40 points

Review 20

40

Write the following words as numbers with exponents.

6 points:

1. two squared 2^2
2. three squared 3^2
3. four cubed 4^3
4. five to the fourth 5^4
5. ten squared 10^2
6. nine to the sixteenth 9^{16}

5 points:

Work out the following problems.

7. 3^2 = 9
8. 4^3 = 64
9. 9^2 = 81
10. 10^3 = 1000
11. 2^5 = 32

3 points:

Write the following numbers with exponents as words.

12. 5^3 five cubed
13. 6^5 six to the fifth
14. 7^3 seven cubed

1 point:

15. Figure out what *A* is on the following number line.

A = 35

1 point:

16. Write 914,000,000,000 in words.

nine hundred fourteen billion

3 points:

17. Factors of 36 = 6 x 6, 2 x 18, 4 x 9 (also: 3 x 12)

1 point:

18. 63238 ÷ 7 = 9034

1 point:

19. Find the average of 118, 320, 214, and 400.

263

2 points:

20. Write two and seven tenths in decimals.

2.7

21. Write 7.013 in words.

seven and thirteen thousandths

2 points:

22. 9 + 1.8 + 37.931 = 48.731
23. 6.3 − 1.471 = 4.829

2 points:

24. Round off 65,521,318 to the nearest million.

66,000,000

25. Round off 69.73148 to the nearest one.

70.

1 point:

26. 149 × .49 = 73.01

2 points:

27. Write MMCDXXII in Arabic numbers.

2422

28. Write 1,693 in Roman numerals.

MDCXCIII

1 point:

29. 41.663 ÷ .61 = 68.3

2 points:

30. A car weighs 1.9 tons. How many pounds is that?

3,800 pounds

31. Mungo Hulk weighs 845 pounds. He wants to lose 3 pounds every day of the month of March, and he plans to do it by starving himself and sweating in a Turkish bath. How much will he weigh at the end of March if he sticks to his plan?

752 pounds

2 points:

32. Circle the metric measure you would use to measure the length of a baseball bat.

millimeter
centimeter
(meter)
kilometer

33. Which metric measure would you use to measure the width of this book?

centimeter

5 points:

34. How many seconds are in a minute? 60

35. How many days are in a year? 365

36. How many ounces are in a pound? 16

37. How many years are in a century? 100

38. How many years are in a decade? 10

Page 13 - 35 points

Introduction to Fractions 3

35

Shade in the following circles. Look at the fractions to decide how many parts to shade in.

10 points:

1. $\frac{1}{2}$ 
3. $\frac{1}{4}$ 
5. $\frac{3}{4}$ 
7. $\frac{1}{3}$ 
9. $\frac{2}{3}$ 
2. $\frac{1}{6}$ 
4. $\frac{5}{6}$ 
6. $\frac{1}{8}$ 
8. $\frac{4}{8}$ 
10. $\frac{7}{8}$ 

16 points:

Now work out the following problems.

11. $\frac{5}{6} - \frac{4}{6} = \frac{1}{6}$
12. $\frac{2}{3} + \frac{1}{3} = \frac{3}{3}$
13. $\frac{6}{11} + \frac{4}{11} = \frac{10}{11}$
14. $\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$
15. $\frac{6}{9} - \frac{5}{9} = \frac{1}{9}$
16. $\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$
17. $\frac{2}{7} + \frac{5}{7} = \frac{7}{7}$
18. $\frac{9}{10} - \frac{1}{10} = \frac{8}{10}$
19. $\frac{6}{9} - \frac{4}{9} = \frac{2}{9}$
20. $\frac{7}{8} + \frac{1}{8} = \frac{8}{8}$
21. $\frac{2}{13} + \frac{9}{13} = \frac{11}{13}$
22. $\frac{6}{7} - \frac{5}{7} = \frac{1}{7}$
23. $\frac{4}{5} - \frac{3}{5} = \frac{1}{5}$
24. $\frac{2}{9} + \frac{7}{9} = \frac{9}{9}$
25. $\frac{6}{10} + \frac{3}{10} = \frac{9}{10}$
26. $\frac{4}{17} + \frac{8}{17} = \frac{12}{17}$

4 points:

27. Which of the answers above are equal to one whole? $\frac{3}{3}$ $\frac{7}{7}$ $\frac{8}{8}$ $\frac{9}{9}$

The following fractions are equal to one whole: $\frac{2}{2}$, $\frac{3}{3}$, $\frac{4}{4}$, $\frac{5}{5}$, $\frac{6}{6}$, and so on. You will need to use fractions which equal one whole in the problems below.
Remember: The denominator (bottom) of each fraction tells how many pieces there are in one whole thing if it is divided into parts.

Work out the following problems.

5 points:

28. A boy eats $\frac{1}{3}$ of a pie. What fraction is left? $\frac{2}{3}$
29. The boy eats $\frac{1}{4}$ of the pie. What fraction is left? $\frac{3}{4}$
30. The boy eats $\frac{5}{8}$ of the pie. What fraction is left? $\frac{3}{8}$
31. A girl got $\frac{9}{10}$ right on a test. What fraction did she get wrong? $\frac{1}{10}$
32. If she got $\frac{7}{10}$ right, what fraction did she get wrong? $\frac{3}{10}$

Page 14 —— 38 points

Introduction to Fractions 4

38

10 points:

Shade in the following circles. Look at the fractions to decide how many parts to shade in.

1. $\frac{1}{4}$ 
2. $\frac{3}{4}$ 
5. $\frac{5}{8}$ 
7. $\frac{7}{8}$ 
9. $\frac{2}{3}$ 

2. $\frac{1}{2}$ 
4. $\frac{1}{3}$ 
6. $\frac{5}{6}$ 
8. $\frac{1}{6}$ 
10. $\frac{4}{4}$ 

16 points:

Now work out the following problems.

11. $\frac{7}{9} - \frac{4}{9} = \frac{3}{9}$
12. $\frac{4}{5} - \frac{3}{5} = \frac{1}{5}$
13. $\frac{5}{8} + \frac{3}{8} = \frac{8}{8}$
14. $\frac{6}{12} + \frac{5}{12} = \frac{11}{12}$
15. $\frac{2}{11} + \frac{9}{11} = \frac{11}{11}$
16. $\frac{4}{9} + \frac{3}{9} = \frac{7}{9}$
17. $\frac{2}{8} + \frac{5}{8} = \frac{7}{8}$
18. $\frac{2}{3} + \frac{1}{3} = \frac{3}{3}$
19. $\frac{4}{13} + \frac{9}{13} = \frac{13}{13}$
20. $\frac{2}{17} - \frac{1}{17} = \frac{1}{17}$
21. $\frac{4}{9} + \frac{3}{9} = \frac{7}{9}$
22. $\frac{2}{7} + \frac{5}{7} = \frac{7}{7}$
23. $\frac{5}{10} + \frac{4}{10} = \frac{9}{10}$
24. $\frac{6}{7} - \frac{4}{7} = \frac{2}{7}$
25. $\frac{8}{9} - \frac{6}{9} = \frac{2}{9}$
26. $\frac{2}{21} + \frac{9}{21} = \frac{11}{21}$

5 points:

27. Which of the answers above are equal to one whole?
$\frac{8}{8}$ $\frac{11}{11}$ $\frac{3}{3}$ $\frac{13}{13}$ $\frac{7}{7}$

Now work out the following problems.

7 points:

28. A hotel has $\frac{14}{20}$ of its rooms filled. What fraction of the hotel is not filled? $\frac{6}{20}$
29. A boy gets $\frac{11}{25}$ right on a test. What fraction is wrong? $\frac{14}{25}$
30. A girl eats $\frac{7}{8}$ of a pie. What fraction is left? $\frac{1}{8}$
31. A used car salesman sells $\frac{24}{27}$ of his cars. What fraction is left? $\frac{3}{27}$
32. $\frac{19}{24}$ of the students in a class are present. What fraction of the class is not present? $\frac{5}{24}$
33. $\frac{14}{21}$ of the students in a class are girls. What fraction of the class is boys? $\frac{7}{21}$
34. $\frac{6}{26}$ of the alphabet is vowels. What fraction is consonants? $\frac{20}{26}$

Page 15 — 25 points

Test 20 — Introduction to Fractions

25

10 points:

Shade in the correct number of parts in each circle below.

1. $\frac{1}{2}$ 
3. $\frac{3}{4}$ 
6. $\frac{1}{4}$ 
7. $\frac{1}{3}$ 
9. $\frac{2}{3}$ 

2. $\frac{5}{6}$ 
4. $\frac{1}{8}$ 
6. $\frac{3}{8}$ 
8. $\frac{7}{8}$ 
10. $\frac{1}{6}$ 

Now work out the following problems.

8 points:

11. $\frac{4}{5} - \frac{3}{5} = \frac{1}{5}$
12. $\frac{4}{19} + \frac{8}{19} = \frac{12}{19}$
13. $\frac{9}{17} + \frac{7}{17} = \frac{16}{17}$
14. $\frac{3}{9} - \frac{2}{9} = \frac{1}{9}$
15. $\frac{5}{8} - \frac{4}{8} = \frac{1}{8}$
16. $\frac{6}{11} + \frac{5}{11} = \frac{11}{11}$
17. $\frac{6}{7} + \frac{1}{7} = \frac{7}{7}$
18. $\frac{5}{10} + \frac{4}{10} = \frac{9}{10}$

2 points:

19. Which of the above answers are equal to one whole? $\frac{11}{11}$ $\frac{7}{7}$

Now work out the following problems.

5 points:

20. A boy eats $\frac{3}{5}$ of a pie. What fraction of the pie is left? $\frac{2}{5}$
21. A girl gets $\frac{2}{25}$ of a test wrong. What fraction is right? $\frac{23}{25}$
22. A boy spends $\frac{51}{100}$ of a dollar on candy. What fraction of the dollar is left? $\frac{49}{100}$
23. A car travels $\frac{13}{30}$ of a trip. What fraction of the trip is left to go? $\frac{17}{30}$
24. A school is $\frac{97}{200}$ boys. What fraction of the school is girls? $\frac{103}{200}$

Page 16 — 14 points

Review Test 20

14

14 points:

1. Figure out what *A* is on the following number line.

A = 32

2. Write 309,000,000,000 in words.

three hundred nine billion

Write four hundred ninety-seven million in numbers.

497,000,000

3. Factor 18 in two ways. 3 x 6

2 x 9

4. 45523 ÷ 7 = 6503 2/7

5. Find the average of 18, 36, and 24.

26

6. Write 2.07 in words.

two and seven hundredths

Write eight and eleven thousandths in decimals.

8.011

7. 3.5 + 21 + 2.479 = 26.979

8. 93.4 − 56.218 = 37.182

9. Round off 57,245 to the nearest thousand.

57,000

10. Round off 73.7489213 to the nearest one.

74.

11. 2.07 × .93 = 1.9251

12. Write CMLXXXVI as an Arabic number.

986

Write 2,742 in Roman numerals.

MMDCCXLII

13. 352.83 ÷ 5.7 = 61.9

14. Three squared + two cubed = 17

5^4 = 625

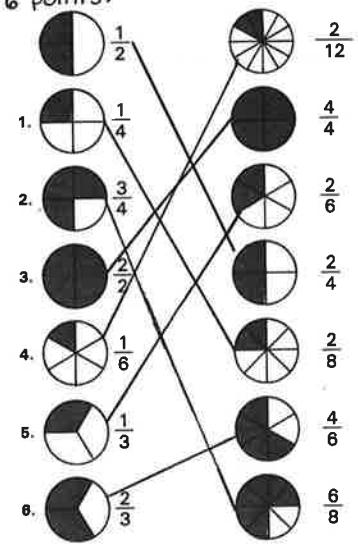
Page 17 — 35 points

Unit 21—Equivalent Fractions 1

35

Draw a line between each pair of fractions that is the same. Looking at the shaded parts will help you.

6 points:



Shade in the second circle so it is equal to the first one. Then fill in the numerator (top) of the fraction next to the second circle and on the next line of the problem.

19 points:

7. $\frac{1}{2}$  is the same as (is equivalent to)  $\frac{2}{4}$,
so $\frac{1}{2} = \frac{2}{4}$

8. $\frac{1}{2}$  is the same as  $\frac{4}{8}$,
so $\frac{1}{2} = \frac{4}{8}$

9. $\frac{1}{2}$  is the same as  $\frac{3}{6}$,
so $\frac{1}{2} = \frac{3}{6}$

10. $\frac{2}{3}$  is the same as  $\frac{4}{6}$
so $\frac{2}{3} = \frac{4}{6}$

11. $\frac{3}{4}$  is the same as  $\frac{6}{8}$,
so $\frac{3}{4} = \frac{6}{8}$

You can't always use drawings to find *equivalent fractions*. There is a quicker and easier way. Find the number that is multiplied by the old denominator (bottom) to get the new denominator; then multiply the old numerator (top) by the same number.

Solve the problems below. You will be finding equivalent fractions. An example has been done for you. Study it before you do the problems.

Example:

$\frac{2}{3} \overset{\times 2}{=} \frac{4}{6}$ (×2 from 2 to 4, ×2 from 3 to 6)

10 points:

12. $\frac{4}{5} = \frac{8}{10}$

13. $\frac{3}{5} = \frac{9}{15}$

14. $\frac{6}{7} = \frac{18}{21}$

15. $\frac{1}{3} = \frac{4}{12}$

16. $\frac{6}{7} = \frac{12}{14}$

17. $\frac{2}{3} = \frac{6}{9}$

18. $\frac{4}{5} = \frac{16}{20}$

19. $\frac{8}{9} = \frac{24}{27}$

20. $\frac{1}{2} = \frac{6}{12}$

21. $\frac{4}{7} = \frac{20}{35}$

Page 18 —— 39 points

Equivalent Fractions 2

39

In each problem, shade in the circles so they are equal. Then fill in the numerator (top) of the fraction next to the second circle.

25 points:

1. $\frac{1}{2}$  is the same as (is equivalent to)  $\frac{2}{4}$
2. $\frac{1}{2}$  is the same as  $\frac{4}{8}$
3. $\frac{1}{2}$  is the same as  $\frac{3}{6}$
4. $\frac{1}{2}$  is the same as  $\frac{6}{12}$
5. $\frac{1}{4}$  is the same as  $\frac{2}{8}$
6. $\frac{3}{4}$  is the same as  $\frac{6}{8}$
7. $\frac{4}{4}$  is the same as  $\frac{8}{8}$
8. $\frac{1}{3}$  is the same as  $\frac{2}{6}$
9. $\frac{2}{3}$  is the same as  $\frac{4}{6}$

Find equivalent fractions. Remember to multiply or divide the numerator and denominator by the same number. Before you try the following problems, study the two examples which have been done for you.

14 points:

Examples:

$\frac{2}{3} \overset{\times 3}{=} \frac{6}{9}$ $\quad$ $\frac{14}{21} \overset{\div 7}{=} \frac{2}{3}$

10. $\frac{4}{5} = \frac{8}{10}$ (×2)
11. $\frac{6}{7} = \frac{12}{14}$
12. $\frac{1}{2} = \frac{4}{8}$
13. $\frac{3}{7} = \frac{9}{21}$
14. $\frac{4}{5} = \frac{16}{20}$
15. $\frac{1}{9} = \frac{2}{18}$
16. $\frac{3}{7} = \frac{18}{42}$
17. $\frac{8}{14} = \frac{4}{7}$ (÷2)
18. $\frac{12}{20} = \frac{3}{5}$
19. $\frac{12}{27} = \frac{4}{9}$
20. $\frac{12}{22} = \frac{6}{11}$
21. $\frac{25}{45} = \frac{5}{9}$
22. $\frac{20}{30} = \frac{2}{3}$
23. $\frac{15}{50} = \frac{3}{10}$

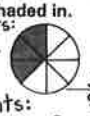
Page 19 — 36 points

Review 21

36

In each drawing below, tell what fraction is shaded in.

3 points:

1.  $\frac{3}{8}$
2.  $\frac{3}{4}$
3.  $\frac{7}{9}$

3 points:

4. If $\frac{9}{10}$ of a test is right, what fraction is wrong? $\frac{1}{10}$
5. If $\frac{7}{15}$ of a job is done, what fraction remains to be done? $\frac{8}{15}$
6. If a tree is $\frac{4}{5}$ dead, what fraction is alive? $\frac{1}{5}$

3 points:

7. $\frac{4}{7} + \frac{2}{7} =$ $\frac{6}{7}$
8. $\frac{1}{11} + \frac{4}{11} =$ $\frac{5}{11}$
9. $\frac{9}{10} + \frac{1}{10} =$ $\frac{10}{10}$

1 point:

10. Figure out what *A* is on the following number line.

14 — A — 42

A = 35

1 point:

11. Factors of 27 = 3 x 9

1 point:

12. Write four hundred seventeen billion in numbers.

417,000,000,000

1 point:

13. 7483 ÷ 6 = $1247\frac{1}{6}$

1 point:

14. Find the average of 17 and 31.

24

1 point:

15. Write 10.03 in words.

Ten and three hundredths

2 points:

16. 18.6 + 9.73 = 28.33
17. 93.4 − 19.138 = 74.262

2 points:

18. Round off 16,793,211 to the nearest million.

17,000,000

19. Round off 7.43799 to the nearest tenth.

7.4

1 point:

20. 14.9 x 28 = 417.2

2 points:

21. Write MMCDLXXVI in Arabic numbers.

2,476

22. Write 3,624 in Roman numerals.

MMMDCXXIV

5 points:

23. Circle the measures for volume.

kilometers
(liters)
feet
(cups)
(gallons)
miles
(quarts)
(milliliters)
meters

1 point:

24. 40.992 − .61 = 40.382

1 point:

25. 9^3 = 729

2 points:

26. The fuel tank of Mr. Cante's car holds 15.4 gallons. How far can he drive on a full tank if the car gets 19 miles to each gallon?

292.6 miles

27. Jan broke open her piggy bank and found 15 quarters, 29 dimes, 37 nickels, and 215 pennies. How much is this in dollars and cents?

$10.65

5 points:

28. How many days are in June? 30

29. How many days are in September? 30

30. How many days are in July? 31

31. How many days are in a leap year? 366

32. How many pounds are in a ton? 2,000

Page 21 — 26 points

Equivalent Fractions 3

26

Write the equivalent fractions in the problems below.

12 points:

1. $\frac{1}{2} = \frac{3}{6}$
2. $\frac{3}{4} = \frac{9}{12}$
3. $\frac{5}{6} = \frac{10}{12}$
4. $\frac{8}{11} = \frac{24}{33}$
5. $\frac{20}{25} = \frac{4}{5}$
6. $\frac{2}{9} = \frac{4}{18}$
7. $\frac{18}{21} = \frac{6}{7}$
8. $\frac{1}{10} = \frac{3}{30}$
9. $\frac{35}{49} = \frac{5}{7}$
10. $\frac{2}{3} = \frac{22}{33}$
11. $\frac{27}{30} = \frac{9}{10}$
12. $\frac{1}{8} = \frac{5}{40}$

If you are asked to find the *lowest common denominator*, you must give the same denominator to all the fractions you are working with. To find the lowest common denominator, you find the smallest number into which all denominators can be divided evenly.

Example:

$\frac{2}{3} = \frac{8}{12}$

3 and 4 (the denominators) can both be divided into 12, so 12 is a common denominator.

3 and 4 can also be divided into 24, but 24 is not the lowest common denominator.

$\frac{3}{4} = \frac{9}{12}$

12 is the lowest common denominator for 3 and 4.

Now find the lowest common denominators for the problems below. Make sure you write the lowest common denominators every place where they should be.

14 points:

13. $\frac{5}{8} = \frac{15}{24}$ 6 and 8 can both be divided into 24, so 24 is the common denominator. Is it the lowest? yes

$\frac{1}{6} = \frac{4}{24}$

15. $\frac{5}{6} = \frac{5}{6}$

$\frac{2}{3} = \frac{4}{6}$

14. $\frac{1}{5} = \frac{4}{20}$ 5 and 4 both go into 20, so 20 is the common denominator. Is it the lowest? yes

$\frac{3}{4} = \frac{15}{20}$

16. $\frac{3}{10} = \frac{9}{30}$

$\frac{5}{6} = \frac{25}{30}$

Page 22 — 37 points

Equivalent Fractions 4

37

Find the equivalent fractions in the following problems.

16 points:

1. $\frac{2}{3} = \frac{6}{9}$
2. $\frac{15}{18} = \frac{5}{6}$
3. $\frac{4}{5} = \frac{16}{20}$
4. $\frac{14}{16} = \frac{7}{8}$
5. $\frac{8}{12} = \frac{2}{3}$
6. $\frac{18}{33} = \frac{6}{11}$
7. $\frac{4}{9} = \frac{12}{27}$
8. $\frac{3}{5} = \frac{18}{30}$
9. $\frac{5}{8} = \frac{15}{24}$
10. $\frac{2}{3} = \frac{14}{21}$
11. $\frac{20}{35} = \frac{4}{7}$
12. $\frac{8}{9} = \frac{72}{81}$
13. $\frac{1}{12} = \frac{3}{36}$
14. $\frac{2}{9} = \frac{10}{45}$
15. $\frac{6}{7} = \frac{42}{49}$
16. $\frac{40}{64} = \frac{5}{8}$

Find the lowest common denominator for each group of fractions below. Make sure you write the lowest common denominator every place where it should be.

21 points:

17. $\frac{1}{3} = \frac{4}{12}$, $\frac{3}{4} = \frac{9}{12}$
18. Is it 10, 30, 36, or 60? $\frac{2}{3} = \frac{20}{30}$, $\frac{5}{6} = \frac{25}{30}$, $\frac{4}{5} = \frac{24}{30}$
19. $\frac{3}{8} = \frac{3}{8}$, $\frac{1}{4} = \frac{2}{8}$
20. $\frac{4}{9} = \frac{8}{18}$, $\frac{1}{6} = \frac{3}{18}$, $\frac{2}{3} = \frac{12}{18}$
21. $\frac{3}{7} = \frac{6}{14}$, $\frac{1}{2} = \frac{7}{14}$
22. $\frac{1}{2} = \frac{5}{10}$, $\frac{3}{10} = \frac{3}{10}$, $\frac{4}{5} = \frac{8}{10}$
23. Is it 12, 16, 24, or 48? $\frac{3}{8} = \frac{9}{24}$, $\frac{2}{3} = \frac{16}{24}$, $\frac{5}{6} = \frac{20}{24}$
24. $\frac{1}{3} = \frac{8}{24}$, $\frac{3}{4} = \frac{18}{24}$, $\frac{5}{8} = \frac{15}{24}$

Page 23 — 20 points

Test 21 — Equivalent Fractions

20

Find the equivalent fractions in the problems below.

10 points:

1. $\frac{2}{3} = \frac{4}{6}$
2. $\frac{1}{2} = \frac{12}{24}$
3. $\frac{4}{5} = \frac{20}{25}$
4. $\frac{5}{8} = \frac{15}{24}$
5. $\frac{3}{11} = \frac{6}{22}$
6. $\frac{5}{5} = \frac{20}{20}$
7. $\frac{5}{6} = \frac{35}{42}$
8. $\frac{3}{7} = \frac{12}{28}$
9. $\frac{4}{9} = \frac{20}{45}$
10. $\frac{5}{6} = \frac{15}{18}$

Now find the lowest common denominator for each group of fractions below. Make sure you write the lowest common denominator every place where it should be.

10 points:

11. Is it 20, 10, or 40? $\frac{1}{5} = \frac{4}{20}$, $\frac{1}{2} = \frac{10}{20}$, $\frac{3}{4} = \frac{15}{20}$
12. Is it 14, 28, or 42? $\frac{4}{7} = \frac{16}{28}$, $\frac{1}{4} = \frac{7}{28}$, $\frac{1}{2} = \frac{14}{28}$
13. $\frac{5}{6} = \frac{10}{12}$, $\frac{1}{3} = \frac{4}{12}$, $\frac{3}{4} = \frac{9}{12}$, $\frac{1}{2} = \frac{6}{12}$

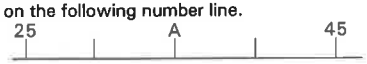
Page 24 —— 16 points

Review Test 21

16

16 points:

1. Find the interval, and figure out what *A* is on the following number line.



A = 35

2. Write 600,000 in words.

six hundred thousand

Write four hundred twenty-nine trillion in numbers.

429,000,000,000,000

3. Factor 26. 2 x 13

4. 72575 ÷ 9 = 8063 $\frac{8}{9}$

5. Find the average of 16, 23, 19, 11, and 21.

18

6. Write 7.003 in words.

seven and three thousandths

Write four and one tenth in decimals.

4.1

7. 291.5 + 7 + 8.471 = 306.971

8. 91.5 − 26.258 = 65.242

9. Round off 89,623,210 to the nearest million.

90,000,000

10. Round off .4735897 to the nearest hundredth.

.47

11. 8.47 × 26 = 220.22

12. Write MDCCCLXIX as an Arabic number.

1,869

Write 3,334 in Roman numerals.

MMMCCCXXXIV

13. 12.816 ÷ .48 = 26.7

14. Seven squared = 49

9^2 = 81

15. What fraction of the circle is shaded in?

$\frac{3}{4}$

16. If $\frac{11}{21}$ of a class is boys, what fraction is girls? $\frac{10}{21}$

Page 25 – 42 points

Unit 22 – Ratios 1

42

To find *ratios* divide the first number into the second number and multiply the answer by the third number.

Example:

4 is to 12 as 5 is to 15 or $\frac{4}{12} = \frac{5}{15}$ ← This line means "is to."

$4\overline{)12}$ $\quad \frac{3}{}$ $\quad 3 \times 5 = 15$

39 points;

Do the following ratio problems.

1. 9 is to 18 as 3 is to 6 or $\frac{9}{18} = \frac{3}{6}$
2. 2 is to 8 as 3 is to 12 or $\frac{2}{8} = \frac{3}{12}$
3. 5 is to 15 as 6 is to 18 or $\frac{5}{15} = \frac{6}{18}$
4. 10 is to 20 as 11 is to 22 or $\frac{10}{20} = \frac{11}{22}$
5. 7 is to 14 as 8 is to 16 or $\frac{7}{14} = \frac{8}{16}$
6. 8 is to 24 as 6 is to 18 or $\frac{8}{24} = \frac{6}{18}$
7. 3 is to 15 as 4 is to 20 or $\frac{3}{15} = \frac{4}{20}$
8. 7 is to 21 as 10 is to 30 or $\frac{7}{21} = \frac{10}{30}$
9. 2 is to 6 as 4 is to 12 or $\frac{2}{6} = \frac{4}{12}$
10. 10 is to 50 as 6 is to 30 or $\frac{10}{50} = \frac{6}{30}$
11. 8 is to 56 as 9 is to 63 or $\frac{8}{56} = \frac{9}{63}$
12. 2 is to 10 as 4 is to 20 or $\frac{2}{10} = \frac{4}{20}$
13. 7 is to 56 as 8 is to 64 or $\frac{7}{56} = \frac{8}{64}$
14. 6 is to 24 as 7 is to 28 or $\frac{6}{24} = \frac{7}{28}$

Use the same method as you used above to work out the next three problems.

3 points:

15. 2 bars of candy cost 12 cents, so 5 bars of candy would cost 30 cents.
16. 3 cans of tonic cost 15 cents, so 4 cans would cost 20 cents.
17. 5 cans of soup cost 40 cents, so 3 cans would cost 24 cents.

Page 26 — 39 points

Ratios 2

39

Work out the following ratio problems.
Remember: Divide the first number into the second, and then multiply the answer by the third number.

31 points:

1. 7 is to 35 as 8 is to 40 or $\frac{7}{35} = \frac{8}{40}$
2. 6 is to 54 as 7 is to 63 or $\frac{6}{54} = \frac{7}{63}$
3. 5 is to 25 as 4 is to 20 or $\frac{5}{25} = \frac{4}{20}$
4. 12 is to 36 as 5 is to 15 or $\frac{12}{36} = \frac{5}{15}$
5. 6 is to 30 as 7 is to 35 or $\frac{6}{30} = \frac{7}{35}$
6. 2 is to 12 as 3 is to 18 or $\frac{2}{12} = \frac{3}{18}$
7. 8 is to 24 as 9 is to 27 or $\frac{8}{24} = \frac{9}{27}$
8. 4 is to 36 as 6 is to 54 or $\frac{4}{36} = \frac{6}{54}$
9. 6 is to 18 as 9 is to 27 or $\frac{6}{18} = \frac{9}{27}$
10. 7 is to 28 as 8 is to 32 or $\frac{7}{28} = \frac{8}{32}$
11. 12 is to 24 as 11 is to 22 or $\frac{12}{24} = \frac{11}{22}$

Note that the colon (:) is short for "is to."

6 points:

12. 6 : 36 = 7 : 42
13. 9 : 63 = 10 : 70
14. 3 : 30 = 5 : 50
15. 8 : 32 = 9 : 36
16. 4 : 16 = 6 : 24
17. 9 : 18 = 8 : 16

Use the same method as you used above to work out the next two problems.

2 points:

18. 2 tires cost $50, so 5 tires would cost $125.
19. 6 cans of beer cost $1.20, so 7 cans would cost $1.40.

Pages 27 and 28 — 44 points (43 points was incorrect)

Review 22

~~43~~ 44

Find equivalent fractions by putting the correct numerator over each denominator.

7 points:

1. $\frac{4}{5} = \frac{12}{15}$
2. $\frac{1}{8} = \frac{2}{16}$
3. $\frac{5}{7} = \frac{25}{35}$
4. $\frac{9}{10} = \frac{27}{30}$
5. $\frac{12}{24} = \frac{24}{48}$
6. $\frac{1}{2} = \frac{50}{100}$
7. $\frac{9}{11} = \frac{36}{44}$

Do the following problems.

3 points:

8. $\frac{9}{13} - \frac{3}{13} = \frac{6}{13}$
9. $\frac{4}{7} + \frac{2}{7} = \frac{6}{7}$
10. $\frac{3}{19} + \frac{14}{19} = \frac{17}{19}$

2 points:

11. If $\frac{8}{11}$ of a pie is eaten, how much is left? $\frac{3}{11}$

12. If $\frac{57}{100}$ of the rooms in a hotel are taken, what fraction of the rooms are empty? $\frac{43}{100}$

1 point:

13. Write fourteen million in numbers. 14,000,000

4 points:

14. Factors of 80 = 2 x 40, 8 x 10, 5 x 16, 4 x 20

1 point:

15. 25264 ÷ 9 = $2807\frac{1}{9}$

1 point:

16. 8^2 = 64

1 point:

17. Find the average of 99, 13, and 53. 55

1 point:

18. Write MMCMLXIV in Arabic numbers. 2,964

2 points:

19. Write 14.01 in words. fourteen and one hundredth

20. Write two and eighteen thousandths in decimals. 2.018

2 points:

21. 2.89 + 40 + 1.3 = 44.19
22. 45 − 2.371 = 42.629

2 points:

23. Round off .77731 to the nearest hundredth. .78
24. Round off 88.5931 to the nearest one. 89.

2 points:

25. 78.4 × .52 = 40.768
26. 4555.2 ÷ 73 = 62.4

1 point:

27. Five squared + nine squared + three cubed = 133

1 point:

28. How many days are in February in a non-leap year? 28

5 points:

29. Circle the measures of distance.
kilograms, (inches), pounds, liters, (centimeters), (kilometers), milligrams, (miles), (meters), ounces

2 points:

30. A cross-country runner ran 24.3 miles in 2.7 hours. How fast was he running in miles per hour? 9 miles per hour

31. Beverly weighs 119 pounds on Earth, but she would weigh .38 of that on Mars. What would she weigh on Mars?

45.22 pounds

6 points:

32. How many pounds are in a ton? 2,000

33. How many ounces are in a pound? 16

34. How many cups are in a pint? 2

35. How many quarts are in a gallon? 4

36. How many cents are in a half dollar? 50

37. How many hours are in a day? 24

Page 29— 34 points

Ratios 3

34

Work out the following ratio problems.

30 points:

1. 6 : 12 = 7 : 14
2. 4 : 28 = 8 : 56
3. 2 : 20 = 9 : 90
4. 2 : 14 = 3 : 21
5. 5 : 60 = 6 : 72
6. 4 : 16 = 7 : 28
7. 7 : 14 = 9 : 18
8. 5 : 55 = 6 : 66
9. 12 : 60 = 11 : 55
10. 6 : 42 = 9 : 63
11. 4 : 36 = 8 : 72
12. 9 : 90 = 5 : 50
13. 6 : 36 = 5 : 30
14. 3 : 21 = 12 : 84
15. 9 : 36 = 4 : 16
16. 5 : 25 = 7 : 35
17. 7 : 56 = 9 : 72
18. 2 : 22 = 5 : 55
19. 10 : 100 = 9 : 90
20. 4 : 48 = 6 : 72
21. 3 : 60 = 5 : 100
22. 11 : 22 = 12 : 24
23. 9 : 81 = 7 : 63
24. 5 : 20 = 6 : 24
25. 3 : 30 = 5 : 50
26. 2 : 18 = 8 : 72
27. 3 : 33 = 4 : 44
28. 5 : 35 = 4 : 28
29. 6 : 42 = 2 : 14
30. 7 : 28 = 8 : 32

Now use the same method as you used above to work out the following word problems.

4 points:

31. 3 bags of potato chips cost 15 cents, so 4 bags will cost 20¢.
32. 6 candy bars cost 66 cents, so 8 candy bars will cost 88¢.
33. 2 slices of pizza cost 60 cents, so 4 slices will cost $1.20.
34. 3 hamburgers cost 90 cents, so 2 will cost 60¢.

Page 30 —— 30 points

Ratios 4

30

Carefully work out the following ratio problems.

26 points:

1. 6 : 24 = 7 : 28
2. 3 : 36 = 8 : 96
3. 5 : 40 = 9 : 72
4. 2 : 12 = 4 : 24
5. 4 : 28 = 9 : 63
6. 3 : 33 = 7 : 77
7. 12 : 48 = 5 : 20
8. 9 : 27 = 4 : 12
9. 6 : 54 = 5 : 45
10. 2 : 22 = 7 : 77
11. 4 : 48 = 5 : 60
12. 6 : 60 = 4 : 40
13. 13 : 26 = 3 : 6
14. 7 : 49 = 5 : 35

Here are some more ratio problems. These are a little tricky, so be careful.

15. 5 : 25 = 6 : 30
16. 4 : 12 = 3 : 9
17. 3 : 30 = 5 : 50
18. 6 : 36 = 8 : 48
19. 4 : 16 = 5 : 20
20. 7 : 21 = 9 : 27
21. 3 : 21 = 7 : 49
22. 4 : 44 = 5 : 55
23. 6 : 12 = 12 : 24
24. 9 : 36 = 11 : 44
25. 6 : 24 = 5 : 20
26. 4 : 28 = 5 : 35

Now work out the following word problems.

4 points:

27. 2 games cost 6 dollars; how much would 3 games cost? $9.00.
28. 3 ice-cream cones cost 75 cents, so 5 would cost $1.25.
29. 4 bags of marbles cost 52 cents, so 2 bags would cost 26¢.
30. 5 toy cars cost 45 cents, so 10 would cost 90¢.

Page 31 — 20 points

Test 22—Ratios

20

Work out the following ratio problems.

18 points:

1. 2 is to 14 as 3 is to 21
2. 6 is to 12 as 8 is to 16
3. 5 : 25 = 7 : 35
4. 9 : 27 = 7 : 21
5. 10 : 30 = 3 : 9
6. 4 : 16 = 5 : 20
7. 12 : 36 = 2 : 6
8. 7 : 63 = 5 : 45
9. 4 : 48 = 5 : 60
10. 4 : 40 = 2 : 20
11. 5 : 55 = 2 : 22
12. 7 : 49 = 6 : 42
13. 9 : 90 = 3 : 30
14. 5 : 45 = 7 : 63
15. 8 : 32 = 5 : 20
16. 9 : 45 = 6 : 30
17. 6 : 18 = 7 : 21
18. 5 : 35 = 9 : 63

2 points:

19. If 3 candy bars cost 24 cents, 5 candy bars will cost 40¢.
20. If 5 cans of tonic cost $1.00, 3 cans will cost 60¢.

Page 32 — 16 points

Review Test 22

16

16 points:

1. Find the interval, and figure out what *A* is on the following number line.

A = 26

2. Write 702,000,000,000,000 in words.

seven hundred two trillion

Write ninety-seven billion in numbers.

97,000,000,000

3. Factor 27. 3 x 9

4. 63727 ÷ 7 = 9103 $\frac{6}{7}$

5. Find the average of 628 and 500.

564

6. Write 9.013 in words.

nine and thirteen thousandths

Write two and one hundredths in decimals.

2.01

7. 69 + 4.2 + 115.37 = 188.57

8. 26.4 − 18.268 = 8.132

9. Round off 268,721 to the nearest thousand.

269,000

10. Round off .3547219 to the nearest hundredth.

.35

11. 2.47 × .37 = .9139

12. Write MMMXIII as an Arabic number.

3,013

Write 2,747 in Roman numerals.

MMDCCXLVII

13. 684.32 ÷ 9.1 = 75.2

14. Two cubed = 8

3^5 = 243

15. What fraction of the circle is shaded in?

$\frac{7}{8}$

16. If $\frac{2}{19}$ of a test is wrong, what fraction is right? $\frac{17}{19}$

Page 33 — 8 points

Unit 23 — Fractions with Unlike Denominators 1

8

To add or subtract fractions, the denominators must be the same. If they are not the same to start with, you have to change them to the lowest common denominator.

Lowest common denominators have been found for the following groups of fractions. First, find new numerators to put over the lowest common denominators. (Notice that you are finding equivalent fractions.) Then, add or subtract the numerators (tops).

Example:

$$\frac{2}{3} = \frac{8}{12}$$
$$+\frac{1}{4} = \frac{3}{12}$$

Answer $= \frac{11}{12}$

3. $\frac{2}{5} = \frac{6}{15}$
$+\frac{1}{3} = \frac{5}{15}$
$\frac{11}{15}$

6. $\frac{7}{8} = \frac{21}{24}$
$-\frac{2}{3} = \frac{16}{24}$
$\frac{5}{24}$

8 points:

1. $\frac{5}{9} = \frac{5}{9}$
$+\frac{1}{3} = \frac{3}{9}$
$\frac{8}{9}$

2. $\frac{2}{9} = \frac{8}{36}$
$+\frac{3}{4} = \frac{27}{36}$
$\frac{35}{36}$

4. $\frac{2}{3} = \frac{4}{6}$
$-\frac{1}{6} = \frac{1}{6}$
$\frac{3}{6}$

5. $\frac{8}{9} = \frac{16}{18}$
$-\frac{5}{6} = \frac{15}{18}$
$\frac{1}{18}$

7. $\frac{4}{9} = \frac{8}{18}$
$+\frac{1}{2} = \frac{9}{18}$
$\frac{17}{18}$

8. $\frac{1}{11} = \frac{2}{22}$
$+\frac{1}{2} = \frac{11}{22}$
$\frac{13}{22}$

Page 34 —— 16 points

Fractions with Unlike Denominators 2

16

Find new numerators to put over the lowest common denominators. Then add or subtract the numerators.

8 points:

1. $\frac{4}{5} = \frac{24}{30}$
   $+ \frac{1}{6} = \frac{5}{30}$
   $\frac{29}{30}$

2. $\frac{6}{7} = \frac{12}{14}$
   $- \frac{1}{2} = \frac{7}{14}$
   $\frac{5}{14}$

3. $\frac{3}{4} = \frac{9}{12}$
   $- \frac{2}{3} = \frac{8}{12}$
   $\frac{1}{12}$

4. $\frac{7}{8} = \frac{35}{40}$
   $- \frac{3}{5} = \frac{24}{40}$
   $\frac{11}{40}$

5. $\frac{5}{9} = \frac{5}{9}$
   $+ \frac{1}{3} = \frac{3}{9}$
   $\frac{8}{9}$

6. $\frac{2}{7} = \frac{6}{21}$
   $+ \frac{2}{3} = \frac{14}{21}$
   $\frac{20}{21}$

7. $\frac{2}{3} = \frac{16}{24}$
   $- \frac{1}{8} = \frac{3}{24}$
   $\frac{13}{24}$

8. $\frac{5}{8} = \frac{5}{8}$
   $- \frac{1}{4} = \frac{2}{8}$
   $\frac{3}{8}$

In the following problems, find the lowest common denominator. (Look for the smallest number that both the denominators will divide into evenly.) Then work out the problems by following the same steps as you used for the problems above.

8 points:

9. Is the common denominator 4, (6) or 8?
   $\frac{1}{3} = \frac{2}{6}$
   $+ \frac{1}{2} = \frac{3}{6}$
   $\frac{5}{6}$

10. Is the common denominator 8, 10, or (12)?
    $\frac{2}{3} = \frac{8}{12}$
    $+ \frac{1}{4} = \frac{3}{12}$
    $\frac{11}{12}$

11. $\frac{3}{8} = \frac{9}{24}$
    $- \frac{1}{3} = \frac{8}{24}$
    $\frac{1}{24}$

12. $\frac{6}{7} = \frac{18}{21}$
    $- \frac{2}{3} = \frac{14}{21}$
    $\frac{4}{21}$

13. $\frac{2}{5} = \frac{8}{20}$
    $+ \frac{1}{4} = \frac{5}{20}$
    $\frac{13}{20}$

14. $\frac{1}{9} = \frac{1}{9}$
    $+ \frac{2}{3} = \frac{6}{9}$
    $\frac{7}{9}$

15. $\frac{5}{6} = \frac{5}{6}$
    $- \frac{1}{3} = \frac{2}{6}$
    $\frac{3}{6}$

16. $\frac{2}{7} = \frac{8}{28}$
    $+ \frac{1}{4} = \frac{7}{28}$
    $\frac{15}{28}$

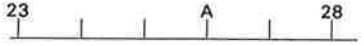
Pages 35 and 36 —— 44 points

Review 23

44

1 point:

1. Figure out what *A* is on the following number line.



A = 26

1 point:

2. Write 19,000,000,000,000 in words.

nineteen trillion

3 points:

3. Factors of 56 = 7x8 4x14 2x28

1 point:

4. 42238 ÷ 7 = 6034

4 points:

5. 4 : 44 = 6 : 66
6. 9 : 45 = 4 : 20
7. 10 : 20 = 100 : 200
8. 12 : 36 = 3 : 9

1 point:

9. Find the average of 713 and 515.

614

1 point:

10. Write ten and seventeen thousandths in decimals.

10.017

2 points:

11. 74 − 21.428 = 52.572
12. 2.4 + 35 + .17 = 37.57

2 points:

13. Round off .44568 to the nearest thousandth.

.446

14. Round off 78.472 to the nearest one.

78.

2 points:

15. 8.21 × 3.7 = 30.377
16. 6.822 ÷ 1.8 = 3.79

5 points:

17. Circle the measures of weight.

miles
(kilograms)
(pounds)
centimeters
inches
(ounces)
kilometers
(tons)
(grams)

2 points:

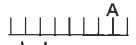
18. How many days are in July? 31
19. How many days are in September? 30

2 points:

20. $7^2 + 5^3$ = 49 + 125 = 174
21. Three to the sixth = 729

1 point:

22. How far along the inch is *A*? Use a fraction to answer.



A = $\frac{7}{8}$

2 points:

23. Write MMCLXVIII as an Arabic number.

2,168

24. Write 3,234 in Roman numerals.

MMMCCXXXIV

2 points:

25. Howard and Bo did $\frac{3}{4}$ of a job. How much remained to be done? $\frac{1}{4}$

26. Gladys read 28 pages an hour as she made her way through a detective novel. It took her exactly 6.5 hours to read the book. How many pages did the book have?

182 pages

12 points:

27. How many cents are in a quarter? 25¢
28. How many cents are in five nickels? 25¢
29. How many cents are in nine dimes? 90¢

30. How many days are in seventeen weeks? 119 days

31. How many ounces are in a pound? 16

32. How many pounds are in a ton? 2,000

33. How many cups are in a pint? 2

34. How many pints are in a quart? 2

35. How many quarts are in a gallon? 4

36. How many inches are in a foot? 12

37. How many feet are in a mile? 5,280

38. How many seconds are in a minute? 60

Page 37 — 15 points

Fractions with Unlike Denominators 3

15

To solve the problems below, use the following steps:

1) Find the lowest common denominator.
2) Find the numerators (tops) to put over the lowest common denominators.
3) Add or subtract the numerators.

12 points:

1. $\frac{3}{5} = \frac{12}{20}$
   $+ \frac{1}{4} = \frac{5}{20}$
   $\frac{17}{20}$

2. $\frac{3}{8} = \frac{9}{24}$
   $+ \frac{1}{6} = \frac{4}{24}$
   $\frac{13}{24}$

3. $\frac{4}{9} = \frac{4}{9}$
   $+ \frac{1}{3} = \frac{3}{9}$
   $\frac{7}{9}$

4. $\frac{2}{3} = \frac{14}{21}$
   $+ \frac{1}{7} = \frac{3}{21}$
   $\frac{17}{21}$

5. $\frac{8}{9} = \frac{16}{18}$
   $- \frac{5}{6} = \frac{15}{18}$
   $\frac{1}{18}$

6. $\frac{5}{6} = \frac{10}{12}$
   $+ \frac{1}{4} = \frac{3}{12}$
   $\frac{13}{12}$

7. $\frac{4}{5} = \frac{12}{15}$
   $- \frac{2}{3} = \frac{10}{15}$
   $\frac{2}{15}$

8. $\frac{1}{3} = \frac{10}{30}$
   $+ \frac{3}{10} = \frac{9}{30}$
   $\frac{19}{30}$

9. $\frac{6}{7} = \frac{12}{14}$
   $- \frac{1}{2} = \frac{7}{14}$
   $\frac{5}{14}$

10. $\frac{3}{8} = \frac{9}{24}$
    $+ \frac{1}{3} = \frac{8}{24}$
    $\frac{17}{24}$

11. $\frac{4}{9} = \frac{16}{36}$
    $+ \frac{1}{4} = \frac{9}{36}$
    $\frac{25}{36}$

12. $\frac{5}{8} = \frac{25}{40}$
    $+ \frac{1}{5} = \frac{8}{40}$
    $\frac{33}{40}$

Each of the following problems contains three fractions. To solve these problems, use the same steps as you used for the problems above.

3 points:

13. $\frac{1}{3} = \frac{4}{12}$
    $\frac{1}{4} = \frac{3}{12}$
    $+ \frac{1}{2} = \frac{6}{12}$
    $\frac{13}{12}$

14. $\frac{1}{2} = \frac{6}{12}$
    $\frac{1}{6} = \frac{2}{12}$
    $+ \frac{1}{4} = \frac{3}{12}$
    $\frac{11}{12}$

15. $\frac{1}{10} = \frac{3}{30}$
    $\frac{1}{3} = \frac{10}{30}$
    $+ \frac{1}{5} = \frac{6}{30}$
    $\frac{19}{30}$

Page 38 —— 19 points

Fractions with Unlike Denominators 4

19

To solve the problems below, use the following steps:

1) Find the lowest common denominator.
2) Find the numerators (tops) to put over the lowest common denominators.
3) Add or subtract the numerators.

16 points:

1. $\frac{1}{6} = \frac{5}{30}$ + $\frac{3}{5} = \frac{18}{30}$ = $\frac{23}{30}$

2. $\frac{7}{8} = \frac{21}{24}$ − $\frac{1}{3} = \frac{8}{24}$ = $\frac{13}{24}$

3. $\frac{5}{6} = \frac{20}{24}$ − $\frac{3}{8} = \frac{9}{24}$ = $\frac{11}{24}$

4. $\frac{1}{2} = \frac{12}{24}$ $\frac{1}{3} = \frac{8}{24}$ + $\frac{1}{8} = \frac{3}{24}$ = $\frac{23}{24}$

5. $\frac{3}{4} = \frac{9}{12}$ − $\frac{1}{3} = \frac{4}{12}$ = $\frac{5}{12}$

6. $\frac{4}{11} = \frac{8}{22}$ + $\frac{1}{2} = \frac{11}{22}$ = $\frac{19}{22}$

7. $\frac{2}{7} = \frac{8}{28}$ + $\frac{1}{4} = \frac{7}{28}$ = $\frac{15}{28}$

8. $\frac{1}{3} = \frac{4}{12}$ $\frac{1}{4} = \frac{3}{12}$ + $\frac{1}{6} = \frac{2}{12}$ = $\frac{9}{12}$

9. $\frac{8}{9} = \frac{16}{18}$ − $\frac{1}{2} = \frac{9}{18}$ = $\frac{7}{18}$

10. $\frac{2}{5} = \frac{8}{20}$ + $\frac{1}{4} = \frac{5}{20}$ = $\frac{13}{20}$

11. $\frac{9}{10} = \frac{27}{30}$ − $\frac{2}{3} = \frac{20}{30}$ = $\frac{7}{30}$

12. $\frac{1}{5} = \frac{6}{30}$ $\frac{1}{6} = \frac{5}{30}$ + $\frac{3}{10} = \frac{9}{30}$ = $\frac{20}{30}$

13. $\frac{4}{5} = \frac{28}{35}$ + $\frac{1}{7} = \frac{5}{35}$ = $\frac{33}{35}$

14. $\frac{1}{2} = \frac{4}{8}$ + $\frac{3}{8} = \frac{3}{8}$ = $\frac{7}{8}$

15. $\frac{5}{6} = \frac{15}{18}$ − $\frac{4}{9} = \frac{8}{18}$ = $\frac{7}{18}$

16. $\frac{1}{3} = \frac{6}{18}$ $\frac{1}{9} = \frac{2}{18}$ + $\frac{1}{6} = \frac{3}{18}$ = $\frac{11}{18}$

Arrange the fractions in the following problems one above the other. Then work out each problem and put the answers on this page.

3 points:

17. $\frac{1}{7} + \frac{2}{3} = \frac{17}{21}$

18. $\frac{4}{5} - \frac{3}{7} = \frac{13}{35}$

19. $\frac{1}{10} + \frac{1}{2} = \frac{12}{20}$

Page 39 — 10 points

Test 23 — Fractions with Unlike Denominators

10

Solve the following problems.

5 points:

1. $\frac{3}{8}\ \frac{9}{24}$ + $\frac{1}{3}\ \frac{8}{24}$ = $\frac{17}{24}$

2. $\frac{1}{4}\ \frac{3}{12}$ + $\frac{1}{6}\ \frac{2}{12}$ = $\frac{5}{12}$

3. $\frac{3}{4}\ \frac{15}{20}$ − $\frac{1}{5}\ \frac{4}{20}$ = $\frac{19}{20}$

4. $\frac{7}{8}\ \frac{21}{24}$ − $\frac{5}{6}\ \frac{20}{24}$ = $\frac{1}{24}$

5. $\frac{5}{9}\ \frac{5}{9}$ + $\frac{1}{3}\ \frac{3}{9}$ = $\frac{8}{9}$

Now do the following problems. Remember to arrange the fractions one above the other before you work each one out.

5 points:

6. $\frac{6}{7} - \frac{2}{3} = \frac{4}{21}$

$\frac{18}{21}$ − $\frac{14}{21}$

7. $\frac{4}{7} + \frac{1}{5} = \frac{27}{35}$

$\frac{20}{35}$ + $\frac{7}{35}$

8. $\frac{1}{6} + \frac{2}{9} = \frac{7}{18}$

$\frac{3}{18}$ + $\frac{4}{18}$

9. $\frac{2}{3} - \frac{3}{10} = \frac{11}{30}$

$\frac{20}{30}$ − $\frac{9}{30}$

10. $\frac{1}{5} + \frac{1}{6} + \frac{1}{3} = \frac{21}{30}$

$\frac{6}{30}$ $\frac{5}{30}$ + $\frac{10}{30}$

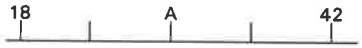
Page 40 — 17 points

Review Test 23

17

17 points:

1. Figure out what *A* is on the following number line.



A = 30

2. Write 230,000,000 in words.

two hundred thirty million

Write fourteen billion in numbers.

14,000,000,000

3. Factor 36 four ways. 6 x 6 2 x 18 3 x 12 4 x 9

4. 51225 ÷ 8 = 6403 1/8

5. Find the average of 17, 23, and 32.

24

6. Write 7.18 in words.

seven and eighteen hundredths

Write two and one thousandth in decimals.

2.001

7. 98 + 3.69 + 2.735 = 104.425

8. 16.8 − 4.231 = 12.569

9. Round off 69,575,214 to the nearest million.

70,000,000

10. Round off .443798 to the nearest tenth.

.4

11. 685 × 3.7 = 2534.5

12. Write MCDLXXXVIII as an Arabic number.

1488

Write 2,845 in Roman numerals.

MMDCCCXLV

13. 468.72 ÷ 6.2 = 75.6

14. Five cubed = 125

4^2 = 16

15. What fraction of the circle is shaded in?

5/6

16. If 3/7 of a job is finished, how much still has to be done? 4/7

17. Complete the ratio.

6 : 18 = 8 : 24

Page 41 — 38 points

Unit 24 — Reducing Fractions 1

38

Reducing fractions to their lowest terms is a way of making them easier to understand. To reduce a fraction, find the largest number that will divide evenly into the top and bottom. This number is called the *highest common factor.* Divide it into the top and bottom, and then write the answers as the reduced fraction.

Example:

6/12 = ____ The highest common factor of 6 and 12 is 6.

$\frac{6}{12} \overset{\div 6}{=} \frac{1}{2}$

Reduce the following fractions to their lowest terms. Before you begin each problem, write the highest common factor in the circle.

38 points:

1. (2) is the highest common factor.

$\frac{2}{4} \overset{\div 2}{=} \frac{1}{2}$

2. (5) is the highest common factor.

$\frac{10}{15} \overset{\div 5}{=} \frac{2}{3}$

3. (2) $\frac{6}{8} = \frac{3}{4}$

4. (5) $\frac{5}{15} = \frac{1}{3}$

5. (2) $\frac{2}{8} = \frac{1}{4}$

6. (2) $\frac{12}{14} = \frac{6}{7}$

7. (6) $\frac{6}{12} = \frac{1}{2}$

8. (4) $\frac{4}{12} = \frac{1}{3}$

9. (2) $\frac{2}{16} = \frac{1}{8}$

10. (4) $\frac{8}{12} = \frac{2}{3}$

11. (2) $\frac{4}{6} = \frac{2}{3}$

12. (2) $\frac{2}{20} = \frac{1}{10}$

13. (2) $\frac{6}{8} = \frac{3}{4}$

14. (6) $\frac{18}{24} = \frac{3}{4}$

15. (3) $\frac{3}{15} = \frac{1}{5}$

16. (3) $\frac{6}{15} = \frac{2}{5}$

17. (6) $\frac{6}{18} = \frac{1}{3}$

18. (4) $\frac{4}{24} = \frac{1}{6}$

19. (4) $\frac{16}{20} = \frac{4}{5}$

20. (9) $\frac{9}{18} = \frac{1}{2}$

21. (10) $\frac{20}{30} = \frac{2}{3}$

Page 42 — 51 points

Reducing Fractions 2

51

Reduce each fraction below to its lowest terms. To do this, write the highest common factor in the circle; then divide the highest common factor into the top and bottom of the fraction.

51 points:

1. (2) $\frac{6}{8} = \frac{3}{4}$
2. (4) $\frac{4}{8} = \frac{1}{2}$
3. (7) $\frac{7}{14} = \frac{1}{2}$
4. (3) $\frac{3}{9} = \frac{1}{3}$
5. (5) $\frac{5}{20} = \frac{1}{4}$
6. (4) $\frac{12}{16} = \frac{3}{4}$
7. (7) $\frac{7}{21} = \frac{1}{3}$
8. (7) $\frac{14}{21} = \frac{2}{3}$
9. (4) $\frac{4}{12} = \frac{1}{3}$
10. (5) $\frac{5}{30} = \frac{1}{6}$
11. (6) $\frac{6}{24} = \frac{1}{4}$
12. (3) $\frac{6}{9} = \frac{2}{3}$
13. (5) $\frac{10}{15} = \frac{2}{3}$
14. (8) $\frac{8}{16} = \frac{1}{2}$
15. (4) $\frac{4}{28} = \frac{1}{7}$
16. (7) $\frac{7}{35} = \frac{1}{5}$
17. (6) $\frac{6}{30} = \frac{1}{5}$
18. (6) $\frac{12}{30} = \frac{2}{5}$
19. (4) $\frac{8}{20} = \frac{2}{5}$
20. (2) $\frac{2}{12} = \frac{1}{6}$
21. (10) $\frac{10}{30} = \frac{1}{3}$
22. (3) $\frac{9}{15} = \frac{3}{5}$
23. (6) $\frac{6}{36} = \frac{1}{6}$
24. (2) $\frac{4}{14} = \frac{2}{7}$
25. (2) $\frac{2}{30} = \frac{1}{15}$
26. (5) $\frac{5}{40} = \frac{1}{8}$
27. (3) $\frac{9}{21} = \frac{3}{7}$

Pages 43 and 44 — 39 points

Review 24

39

6 points:

1. $\frac{1}{3} + \frac{3}{8} = \frac{17}{24}$
2. $\frac{9}{10} - \frac{1}{3} = \frac{17}{30}$
3. $\frac{4}{5} - \frac{3}{4} = \frac{1}{20}$
4. $\frac{3}{7} + \frac{1}{3} = \frac{16}{21}$
5. $\frac{4}{5} - \frac{2}{3} = \frac{2}{15}$
6. $\frac{4}{7} + \frac{1}{4} = \frac{23}{28}$

1 point:

7. Figure out what *A* is on the following number line.

A = 56

1 point:

8. Write 44,000,000,000 in words.

forty-four billion

1 point:

9. Factors of 55 = 5 x 11

2 points:

10. 7 : 49 = 9 : 63
11. 5 : 25 = 7 : 35

2 points:

12. 210.945 ÷ .35 = 602.7
13. 79.1 × .68 = 53.788

1 point:

14. Find the average of 371 and 203.

287

2 points:

15. Write six and one tenth in decimals.

6.1

16. Write 7.011 in words.

seven and eleven thousandths

2 points:

17. 79 + 1.9 + 3.77 = 84.67
18. 22 − 1.73 = 20.27

3 points:

Round off the following to the nearest ten.

19. 77 80
20. 91 90

21. Round off .834793 to the nearest hundredth.

.83

1 point:

22. Write MMCCXLVII as an Arabic number.

2247

2 points:

23. $5^2 + 7^3 =$ 25 + 343 = 368
24. Two to the seventh = 128

2 points:

25. Mr. Spock's Cadillac went 286 miles on a full tank of 22 gallons of gas. How many miles is this gas-guzzler getting to the gallon?

13 miles per gallon

26. A theater charged $3.25 per ticket, and only 93 people came to see the movie. How much did the theater make for that showing?

$ 302.25

10 points:

27. How many nickels are in a dollar? 20
28. How many dimes are in a dollar? 10
29. How many quarters are in a dollar? 4
30. How many half-dollars are in a dollar? 2
31. How many days are in February in a leap year?

29

32. How many days are in March? 31
33. How many days are in November? 30
34. How many quarts are in 4 gallons? 16
35. How many ounces are in 6 pounds? 96
36. How many days are in 6 weeks? 42

3 points :

37. Circle the metric measure you would use to measure the water in a pot.

milliter
(liter)

38. Circle which metric measure you would use to measure the thickness of your fingernail.

(millimeter)
centimeter
meter
kilometer

39. Which metric measure would you use to measure the distance between your eyes?

centimeter

Page 45 — 27 points

Reducing Fractions 3

27

Reduce the following fractions to their lowest terms. Be careful; some of them don't need to be reduced.

20 points:

1. $\frac{4}{8} = \frac{1}{2}$
2. $\frac{6}{12} = \frac{1}{2}$
3. $\frac{2}{3} = \frac{2}{3}$
4. $\frac{7}{14} = \frac{1}{2}$
5. $\frac{2}{12} = \frac{1}{6}$
6. $\frac{4}{16} = \frac{1}{4}$
7. $\frac{8}{9} = \frac{8}{9}$
8. $\frac{11}{22} = \frac{1}{2}$
9. $\frac{9}{27} = \frac{1}{3}$
10. $\frac{14}{21} = \frac{2}{3}$
11. $\frac{6}{18} = \frac{1}{3}$
12. $\frac{3}{24} = \frac{1}{8}$
13. $\frac{8}{16} = \frac{1}{2}$
14. $\frac{4}{30} = \frac{2}{15}$
15. $\frac{9}{21} = \frac{3}{7}$
16. $\frac{7}{42} = \frac{1}{6}$
17. $\frac{2}{21} = \frac{2}{21}$
18. $\frac{8}{80} = \frac{1}{10}$
19. $\frac{16}{24} = \frac{2}{3}$
20. $\frac{18}{27} = \frac{2}{3}$

In the following problems, add or subtract, and then reduce the answer to the lowest terms if necessary.

6 points:

21. $\frac{7}{8} - \frac{3}{8} = \frac{4}{8} = \frac{1}{2}$
22. $\frac{4}{15} + \frac{4}{15} = \frac{8}{15}$
23. $\frac{3}{10} + \frac{3}{10} = \frac{6}{10} = \frac{3}{5}$
24. $\frac{9}{14} - \frac{5}{14} = \frac{4}{14} = \frac{2}{7}$
25. $\frac{5}{9} - \frac{2}{9} = \frac{3}{9} = \frac{1}{3}$
26. $1\frac{1}{6} + 1\frac{1}{6} = 2\frac{2}{6} = 2\frac{1}{3}$

1 point :

27. A woman jogged $\frac{5}{8}$ of a mile one day and $\frac{1}{8}$ of a mile the next. How far did she go in all? $\frac{6}{8} = \frac{3}{4}$ of a mile

Page 46 — 26 points

Reducing Fractions 4

26

Reduce the following fractions to their lowest terms. If a fraction can't be reduced, just copy it the way it is—It's already in its lowest terms.

20 points:

1. $\frac{4}{12} = \frac{1}{3}$
2. $\frac{7}{21} = \frac{1}{3}$
3. $\frac{6}{9} = \frac{2}{3}$
4. $\frac{8}{12} = \frac{2}{3}$
5. $\frac{11}{12} = \frac{11}{12}$
6. $\frac{15}{20} = \frac{3}{4}$
7. $\frac{6}{18} = \frac{1}{3}$
8. $\frac{4}{5} = \frac{4}{5}$
9. $\frac{8}{10} = \frac{4}{5}$
10. $\frac{10}{40} = \frac{1}{4}$
11. $\frac{6}{36} = \frac{1}{6}$
12. $\frac{14}{28} = \frac{1}{2}$
13. $\frac{16}{17} = \frac{16}{17}$
14. $\frac{2}{32} = \frac{1}{16}$
15. $\frac{9}{36} = \frac{1}{4}$
16. $\frac{4}{48} = \frac{1}{12}$
17. $\frac{2}{5} = \frac{2}{5}$
18. $\frac{15}{30} = \frac{1}{2}$
19. $\frac{8}{48} = \frac{1}{6}$
20. $\frac{2}{100} = \frac{1}{50}$

Now work out the following problems. If the answer needs to be reduced to its lowest terms, do so. If not, just leave it as it is.

4 points:

21. $\frac{3}{10} + \frac{2}{10} = \frac{5}{10} = \frac{1}{2}$
22. $\frac{8}{15} + \frac{2}{15} = \frac{10}{15} = \frac{2}{3}$
23. $\frac{6}{10} + \frac{3}{10} = \frac{9}{10}$
24. $\frac{13}{20} - \frac{3}{20} = \frac{10}{20} = \frac{1}{2}$

Solve the following word problem.

2 points:

25. A man painted $\frac{4}{15}$ of his house one day and $\frac{8}{15}$ the next. What fraction of the house was painted? $\frac{12}{15}$ or $\frac{4}{5}$

What fraction did he still have to do? $\frac{1}{5}$

Page 47 — 20 points

Test 24—Reducing Fractions

20

Reduce the following fractions to their lowest terms. If some of them can't be reduced, just copy them as they are.

16 points:

1. $\frac{5}{10} = \frac{1}{2}$
2. $\frac{6}{8} = \frac{3}{4}$
3. $\frac{4}{5} = \frac{4}{5}$
4. $\frac{8}{16} = \frac{1}{2}$
5. $\frac{10}{40} = \frac{1}{4}$
6. $\frac{3}{18} = \frac{1}{6}$
7. $\frac{5}{35} = \frac{1}{7}$
8. $\frac{10}{12} = \frac{5}{6}$
9. $\frac{6}{36} = \frac{1}{6}$
10. $\frac{8}{40} = \frac{1}{5}$
11. $\frac{9}{17} = \frac{9}{17}$
12. $\frac{2}{22} = \frac{1}{11}$
13. $\frac{16}{32} = \frac{1}{2}$
14. $\frac{40}{50} = \frac{4}{5}$
15. $\frac{2}{28} = \frac{1}{14}$
16. $\frac{25}{100} = \frac{1}{4}$

Now work out the following problems. Make sure you give the answers in their lowest terms.

4 points:

17. $\frac{4}{9} + \frac{2}{9} = \frac{6}{9} = \frac{2}{3}$
18. $\frac{6}{14} + \frac{1}{14} = \frac{7}{14} = \frac{1}{2}$
19. $\frac{4}{25} + \frac{9}{25} = \frac{13}{25}$
20. $\frac{19}{20} - \frac{4}{20} = \frac{15}{20} = \frac{3}{4}$

Page 48 — 18 points

Review Test 24

18

18 points:

1. Figure out what *A* is on the following number line.

A = 70

2. Write 601,000 in words.

six hundred one thousand

Write five hundred billion in numbers.

500,000,000,000

3. Factor 22. 2 x 11

4. 31555 ÷ 9 = 3506 $\frac{1}{9}$

5. Find the average of 123, 318, and 213.

218

6. Write 12.012 in words.

twelve and twelve thousandths

Write four and two hundredths in decimals.

4.02

7. 9.6 + 17 + 293.42 = 320.02

8. 63.4 − 29.147 = 34.253

9. Round off 62,741 to the nearest thousand.

63,000

10. Round off .6375926 to the nearest thousandth.

.638

11. 7.21 × .47 = 3.3887

12. Write MMMDCCLXXI as an Arabic number.

3771

Write 2,924 in Roman numerals.

MMCMXXIV

13. 44.296 ÷ .56 = 79.1

14. Three squared = 9

5^3 = 125

15. What fraction of the circle is shaded in?

$\frac{1}{4}$

16. If $\frac{17}{29}$ of a hotel is filled, what fraction is empty? $\frac{12}{29}$

17. Complete the ratio.

5 : 55 = 7 : 77

18. $\frac{2}{3} + \frac{1}{4} = \frac{11}{12}$

Page 49 — 23 points

Unit 25 — Improper Fractions and Mixed Numbers 1

23

An *improper fraction* is one like $\frac{8}{3}$ in which the top is bigger than the bottom. If you get an improper fraction in the answer to a problem, you must change it to a *mixed number* for it to be correct.

Example:

Improper fraction → Mixed number

$\frac{8}{3} = 2\frac{2}{3}$

Shade in the circles below. Look at the improper fractions to see how many parts to shade in. Write a whole number to show how many whole circles are filled in, and write a fraction to show what is left over.

Example: $\frac{5}{2}$  $= 2\frac{1}{2}$

14 points:

1. $\frac{7}{3}$  $= 2\frac{1}{3}$

2. $\frac{9}{4}$  $= 2\frac{1}{4}$

3. $\frac{15}{8}$  $= 1\frac{7}{8}$

4. $\frac{12}{2}$  $= 6$

5. $\frac{7}{6}$  $= 1\frac{1}{6}$

6. $\frac{5}{4}$  $= 1\frac{1}{4}$

7. $\frac{4}{2}$  $= 2$

There is an easier way to change improper fractions to mixed numbers. Follow these steps:

1) Divide the bottom of the fraction into the top.
2) Write the answer as a whole number.
3) Write the remainder (if there is one) as a numerator over the same denominator you started with.

Example:

$\frac{7}{5} = 5\overline{)7}$ (1 with remainder 2) $= 1\frac{2}{5}$ Answer

Change the following improper fractions to mixed numbers.

9 points:

8. $\frac{8}{2} = 4$

9. $\frac{3}{2} = 1\frac{1}{2}$

10. $\frac{10}{3} = 3\frac{1}{3}$

11. $\frac{7}{2} = 3\frac{1}{2}$

12. $\frac{14}{5} = 2\frac{4}{5}$

13. $\frac{14}{3} = 4\frac{2}{3}$

14. $\frac{13}{2} = 6\frac{1}{2}$

15. $\frac{13}{10} = 1\frac{3}{10}$

16. $\frac{5}{3} = 1\frac{2}{3}$

Page 50 —— 27 points

Improper Fractions and Mixed Numbers 2

27

Change the following improper fractions to mixed numbers.
Remember the three steps to follow:

1) Divide the bottom of the fraction into the top.
2) Write the answer as a whole number.
3) Write the remainder (if any) as a numerator over the same denominator you started with.

Example:

$\frac{7}{3} = 2\frac{1}{3}$

15 points:

1. $\frac{5}{4} = 1\frac{1}{4}$
2. $\frac{9}{2} = 4\frac{1}{2}$
3. $\frac{4}{2} = 2$
4. $\frac{10}{3} = 3\frac{1}{3}$
5. $\frac{12}{5} = 2\frac{2}{5}$
6. $\frac{8}{7} = 1\frac{1}{7}$
7. $\frac{3}{3} = 1$
8. $\frac{15}{7} = 2\frac{1}{7}$
9. $\frac{5}{4} = 1\frac{1}{4}$
10. $\frac{9}{5} = 1\frac{4}{5}$
11. $\frac{17}{8} = 2\frac{1}{8}$
12. $\frac{14}{7} = 2$
13. $\frac{9}{9} = 1$
14. $\frac{21}{10} = 2\frac{1}{10}$
15. $\frac{17}{2} = 8\frac{1}{2}$

To change mixed numbers back into improper fractions, use the following steps:

1) Multiply the bottom of the fraction by the whole number.
2) Add the top of the fraction to the answer.
3) Write that answer as the top of a fraction with the same denominator that you started with on the bottom.

Example:

$2\frac{3}{4} = \frac{11}{4}$ $(4 \times 2 = 8 + 3 = 11)$

Change the following mixed numbers to improper fractions.

12 points:

16. $2\frac{2}{3} = \frac{8}{3}$
17. $4\frac{1}{3} = \frac{13}{3}$
18. $5\frac{2}{3} = \frac{17}{3}$
19. $1\frac{1}{4} = \frac{5}{4}$
20. $2\frac{5}{9} = \frac{23}{9}$
21. $4\frac{3}{8} = \frac{35}{8}$
22. $6\frac{1}{8} = \frac{49}{8}$
23. $1\frac{9}{10} = \frac{19}{10}$
24. $5\frac{7}{8} = \frac{47}{8}$
25. $10\frac{1}{3} = \frac{31}{3}$
26. $4\frac{6}{7} = \frac{34}{7}$
27. $7\frac{1}{2} = \frac{15}{2}$

Pages 51 and 52 — 49 points

Review 25

49

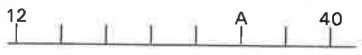
Reduce the following fractions to lowest terms.

11 points:

1. $\frac{4}{6} = \frac{2}{3}$
2. $\frac{9}{21} = \frac{3}{7}$
3. $\frac{4}{6} = \frac{2}{3}$
4. $\frac{6}{9} = \frac{2}{3}$
5. $\frac{7}{49} = \frac{1}{7}$
6. $\frac{4}{20} = \frac{1}{5}$
7. $\frac{5}{25} = \frac{1}{5}$
8. $\frac{21}{24} = \frac{7}{8}$
9. $\frac{30}{33} = \frac{10}{11}$
10. $\frac{3}{15} = \frac{1}{5}$
11. $\frac{9}{15} = \frac{3}{5}$

1 point:

12. Figure out what *A* is on the following number line.



A = 32

2 points:

13. 7 : 14 = 8 : 16
14. 3 : 12 = 5 : 20

2 points:

15. 5581 × .23 = 1283.63
16. 460.734 ÷ .51 = 903.4

2 points:

17. Round off 29512 to the nearest thousand.

30,000

18. Round off 6.9343789 to the nearest thousandth.

6.934

2 points:

19. Write MMCCLXXXII in Arabic numbers.

2282

20. Write 3,428 in Roman numerals.

MMMCDXXVIII

4 points:

21. $\frac{9}{10} + \frac{1}{3} = 1\frac{7}{30}$
22. $\frac{6}{7} - \frac{1}{3} = \frac{11}{21}$
23. $\frac{3}{4} - \frac{1}{8} = \frac{5}{8}$
24. $\frac{2}{5} + \frac{1}{3} = \frac{11}{15}$

1 point:

25. Find the average of 636, 213, and 420.

423

2 points:

26. 7^3 = 343
27. Five to the fourth = 625

2 points:

28. Factors of 81 = 9 x 9 3 x 27

2 points:

29. Write 6.05 in words.

six and five hundredths

30. Write nine hundred thirty-eight billion in numbers.

938,000,000,000

2 points:

31. 47.8 + 9.731 = 57.531
32. 30 − 2.18 = 27.82

3 points:

33. Circle the best metric measure to use to measure a basketball court.

millimeters
centimeters
(meters)
kilometers

34. Which metric measure would be best to measure this piece of paper?

centimeters

35. Circle the best metric measure to use to measure the weight of a dog.

milligrams
grams
(kilograms)

10 points:

36. How many seconds are in a minute?

60

37. How many minutes are in an hour? 60
38. How many hours are in a day? 24

39. How many days are in a week? 7

40. How many days are in a year? 365

41. How many days are in a leap year? 366

42. How many inches are in a foot? 12

43. How many inches are in a yard? 36

44. How many feet are in a mile? 5,280

45. How many cups are in a pint? 2

3 points:

46. A bicycle racer covered 595 miles going 35 miles an hour. How long did this take?

17 hours

47. A woman decided that she liked dimes. She went to the bank and asked for $189.90 worth of dimes. How many dimes did she get?

1,899 dimes

Do you think they'd give that many dimes to her? Why?

Answers will vary.

Page 53 — 25 points

Improper Fractions and Mixed Numbers 3

25

Change the following improper fractions to mixed numbers.

Example:

$\frac{5}{3} = 1\frac{2}{3}$

8 points:

1. $\frac{8}{2} =$ 4
2. $\frac{10}{7} = 1\frac{3}{7}$
3. $\frac{7}{6} = 1\frac{1}{6}$
4. $\frac{12}{3} =$ 4
5. $\frac{15}{7} = 2\frac{1}{7}$
6. $\frac{9}{2} = 4\frac{1}{2}$
7. $\frac{23}{7} = 3\frac{2}{7}$
8. $\frac{14}{3} = 4\frac{2}{3}$

Change the following mixed numbers to improper fractions.

9 points:

9. $2\frac{1}{3} = \frac{7}{3}$
10. $4\frac{3}{4} = \frac{19}{4}$
11. $6\frac{1}{2} = \frac{13}{2}$
12. $9\frac{2}{5} = \frac{47}{5}$
13. $5\frac{1}{2} = \frac{11}{2}$
14. $7\frac{4}{7} = \frac{53}{7}$
15. $12\frac{1}{2} = \frac{25}{2}$
16. $6\frac{2}{9} = \frac{56}{9}$
17. $11\frac{3}{5} = \frac{58}{5}$

Now work out the answers to the following problems. If an answer is an improper fraction, change it to a mixed number.

6 points:

18. $\frac{5}{8} + \frac{7}{8} = \frac{12}{8} = 1\frac{1}{2}$
19. $\frac{2}{3} + \frac{2}{3} = \frac{4}{3} = 1\frac{1}{3}$
20. $\frac{4}{5} + \frac{3}{5} = \frac{7}{5} = 1\frac{2}{5}$
21. $\frac{7}{9} + \frac{8}{9} + \frac{3}{9} = \frac{18}{9} =$ 2
22. $\frac{4}{5} + \frac{3}{5} + \frac{4}{5} = \frac{11}{5} = 2\frac{1}{5}$
23. $\frac{7}{8} + \frac{6}{8} + \frac{5}{8} = \frac{18}{8} = 2\frac{1}{4}$

2 points:

24. $\frac{3}{4} = \frac{15}{20}$
$+ \frac{4}{5} = \frac{16}{20}$
$\frac{31}{20} = 1\frac{11}{20}$

25. $\frac{7}{8} = \frac{35}{40}$
$+ \frac{4}{5} = \frac{32}{40}$
$\frac{67}{40} = 1\frac{27}{40}$

Page 54 —— 25 points

Improper Fractions and Mixed Numbers 4

25

Change the following improper fractions to mixed numbers.

9 points:

1. $\frac{7}{2} = 3\frac{1}{2}$
2. $\frac{5}{3} = 1\frac{2}{3}$
3. $\frac{10}{2} = 5$
4. $\frac{14}{3} = 4\frac{2}{3}$
5. $\frac{24}{5} = 4\frac{4}{5}$
6. $\frac{6}{5} = 1\frac{1}{5}$
7. $\frac{18}{6} = 3$
8. $\frac{24}{7} = 3\frac{3}{7}$
9. $\frac{19}{10} = 1\frac{9}{10}$

Change the following mixed numbers to improper fractions.

9 points:

10. $6\frac{1}{3} = \frac{19}{3}$
11. $4\frac{2}{5} = \frac{22}{5}$
12. $9\frac{1}{2} = \frac{19}{2}$
13. $10\frac{3}{5} = \frac{53}{5}$
14. $1\frac{1}{5} = \frac{6}{5}$
15. $5\frac{2}{7} = \frac{37}{7}$
16. $2\frac{8}{9} = \frac{26}{9}$
17. $7\frac{1}{7} = \frac{50}{7}$
18. $11\frac{1}{5} = \frac{56}{5}$

Work out the following problems. If an answer is an improper fraction, change it to a mixed number.

6 points:

19. $\frac{1}{3} + \frac{2}{3} + \frac{2}{3} = \frac{5}{3} = 1\frac{2}{3}$
20. $\frac{3}{7} + \frac{4}{7} + \frac{6}{7} = \frac{13}{7} = 1\frac{6}{7}$
21. $\frac{2}{9} + \frac{8}{9} + \frac{5}{9} = \frac{15}{9} = 1\frac{2}{3}$
22. $\frac{4}{5} + \frac{4}{5} + \frac{4}{5} = \frac{12}{5} = 2\frac{2}{5}$
23. $\frac{9}{10} + \frac{7}{10} + \frac{5}{10} = \frac{21}{10} = 2\frac{1}{10}$
24. $\frac{14}{15} + \frac{13}{15} + \frac{8}{15} = \frac{35}{15} = 2\frac{1}{3}$

1 point:

25.
$$\begin{array}{r} \frac{7}{8} = \frac{35}{40} \\ +\ \frac{4}{5} = \frac{32}{40} \\ \hline \frac{67}{40} = 1\frac{27}{40} \end{array}$$

Page 55 — 20 points

Test 25 — Improper Fractions and Mixed Numbers

20

Change the following improper fractions to mixed numbers.

7 points:

1. $\frac{5}{2} = 2\frac{1}{2}$
2. $\frac{17}{5} = 3\frac{2}{5}$
3. $\frac{4}{3} = 1\frac{1}{3}$
4. $\frac{25}{5} = 5$
5. $\frac{7}{6} = 1\frac{1}{6}$
6. $\frac{10}{9} = 1\frac{1}{9}$
7. $\frac{28}{5} = 5\frac{3}{5}$

Change the following mixed numbers to improper fractions.

7 points: $\frac{14}{3}$

8. $4\frac{2}{3} = \frac{14}{3}$
9. $8\frac{1}{2} = \frac{17}{2}$
10. $3\frac{5}{6} = \frac{23}{6}$
11. $9\frac{2}{5} = \frac{47}{5}$
12. $16\frac{1}{2} = \frac{33}{2}$
13. $10\frac{5}{7} = \frac{75}{7}$
14. $9\frac{4}{5} = \frac{49}{5}$

Work out the following problems. Give the final answers as mixed numbers.

4 points:

15. $\frac{4}{7} + \frac{5}{7} + \frac{6}{7} = \frac{15}{7} = 2\frac{1}{7}$
16. $\frac{9}{10} + \frac{1}{10} + \frac{7}{10} = \frac{17}{10} = 1\frac{7}{10}$
17. $\frac{2}{3} + \frac{2}{3} + \frac{1}{3} = \frac{5}{3} = 1\frac{2}{3}$
18. $\frac{8}{9} + \frac{2}{9} + \frac{7}{9} = \frac{17}{9} = 1\frac{8}{9}$

2 points:

19.
$$\begin{array}{r} \frac{4}{7} = \frac{12}{21} \\ +\ \frac{2}{3} = \frac{14}{21} \\ \hline \frac{26}{21} = 1\frac{5}{21} \end{array}$$

20.
$$\begin{array}{r} \frac{5}{9} = \frac{25}{45} \\ +\ \frac{4}{5} = \frac{36}{45} \\ \hline \frac{61}{45} = 1\frac{16}{45} \end{array}$$

Page 56 —— 19 points

Review Test 25

19

19 points;

1. Figure out what *A* is on the following number line.

A = 22

2. Write 219,000,000,000 in words.

two hundred nineteen billion

Write three hundred trillion in numbers.

300,000,000,000,000

3. Factor 28 two ways. 2x14 4x7

4. 42379 ÷ 7 = 6054 $\frac{1}{7}$

5. Find the average of 18 and 26.

22

6. Write 3.005 in words.

three and five thousandths

Write thirteen and twelve hundredths in decimals.

13.12

7. 69 + 3.47 + 1.891 = 74.361

8. 26.5 − 18.268 = 8.232

9. Round off 485,621,313 to the nearest million.

486,000,000

10. Round off 29.37842 to the nearest one.

29.

11. 9.03 × 48 = 433.44

12. Write MMCDLXVI as an Arabic number.

2466

Write 3,642 in Roman numerals.

MMMDCXLII

13. 416.02 ÷ 6.2 = 67.1

14. Six squared = 36

2^6 = 64

15. What fraction of the circle is shaded in?

$\frac{3}{8}$

16. If $\frac{13}{20}$ of a test is right, what fraction is wrong? $\frac{7}{20}$

17. Complete the ratio.

9 : 27 = 10 : 30

18. $\frac{6}{7} - \frac{1}{3} = \frac{11}{21}$

19. Reduce the following fractions to lowest terms.

$\frac{8}{30} = \frac{4}{15}$ $\frac{5}{35} = \frac{1}{7}$

Page 57 — 14 points

Unit 26 — Working with Mixed Numbers 1

14

Work out the following problems. First add or subtract the fractions of each mixed number, then add or subtract the whole numbers.

Example:

7 points:

$2\frac{1}{3} + 4\frac{1}{3} = 6\frac{2}{3}$

2. $6\frac{1}{7} + 8\frac{4}{7} = 14\frac{5}{7}$

$10\frac{4}{11} - 2\frac{3}{11} = 8\frac{1}{11}$

6. $9\frac{4}{5} - 4\frac{1}{5} = 5\frac{3}{5}$

1. $9\frac{4}{9} + 7\frac{3}{9} = 16\frac{7}{9}$

3. $24\frac{3}{4} - 5\frac{2}{4} = 19\frac{1}{4}$

5. $10\frac{8}{9} - 5\frac{7}{9} = 5\frac{1}{9}$

7. $29\frac{3}{8} + 14\frac{4}{8} = 43\frac{7}{8}$

Work out the following problems. If the fraction in the answer is an improper fraction, change it to a mixed number. Then add the whole number in the mixed number to the whole number you already have.

Example:

$5\frac{2}{3} + 4\frac{2}{3} = 9\frac{4}{3} =$

$9 + 1\frac{1}{3} = 10\frac{1}{3}$

9. $7\frac{4}{5} + 8\frac{3}{5} = 15\frac{7}{5} = 16\frac{2}{5}$

11. $4\frac{6}{7} + 8\frac{3}{7} = 12\frac{9}{7} = 13\frac{2}{7}$

5 points:

8. $4\frac{5}{8} + 7\frac{3}{8} = 11\frac{8}{8} = 12$

10. $12\frac{4}{11} + 10\frac{2}{11} = 22\frac{6}{11}$

12. $12\frac{7}{9} + 5\frac{8}{9} = 17\frac{15}{9} = 18\frac{2}{3}$

Extra skill: Get a ruler and measure these two lines. Reduce fractions of an inch. Put your answers on the lines below the problems.

2 points:

13. _____ = $2\frac{1}{2}$ inches

14. _____ = $2\frac{3}{4}$ inches

Page 58 —— 20 points

Working with Mixed Numbers 2

20

Work out the following problems. The ones with an asterisk (*) are tricky — the fraction in the answer will be improper, so you will have to change it to a mixed number and then finish the problem.

8 points:

1. $4\frac{7}{11} + 3\frac{1}{11} = 7\frac{8}{11}$
2. $6\frac{5}{9} + 2\frac{2}{9} = 8\frac{7}{9}$
3. $9\frac{1}{3} + 7\frac{1}{3} = 16\frac{2}{3}$
4. $14\frac{2}{3} - 3\frac{1}{3} = 11\frac{1}{3}$
5. $13\frac{7}{8} - 4\frac{6}{8} = 9\frac{1}{8}$
6. $16\frac{5}{8} + 3\frac{2}{8} = 19\frac{7}{8}$
7. $8\frac{4}{5} + 3\frac{3}{5} = 11\frac{7}{5} = 12\frac{2}{5}$ *
8. $14\frac{6}{7} + 5\frac{3}{7} = 19\frac{9}{7} = 20\frac{2}{7}$ *

Subtracting mixed numbers can also be tricky if the fraction on the top isn't as big as the one on the bottom. Then you have to borrow from the whole number. Borrow one whole and turn it into a fraction.

Example:

$4\frac{1}{3} - 1\frac{2}{3}$

$4\frac{1}{3} = 3\frac{4}{3}$ (Borrow $\frac{3}{3}$ from the 4 and add it to $\frac{1}{3}$.)

$3\frac{4}{3} - 1\frac{2}{3} = 2\frac{2}{3}$ Answer

Practice turning one whole into fractions. Remember: to be one whole, the top and bottom of the fraction should be the same.

Example:

4 points:

$1 = \frac{8}{8}$ 9. $1 = \frac{5}{5}$ 10. $1 = \frac{3}{3}$ 11. $1 = \frac{2}{2}$ 12. $1 = \frac{9}{9}$

Try the next two subtraction problems. You will have to borrow from a whole number in each problem.

2 points:

13. $5\frac{3}{8} - 1\frac{5}{8} = 3\frac{6}{8} = 3\frac{3}{4}$
14. $3\frac{1}{9} - 1\frac{5}{9} = 1\frac{5}{9}$

Measure each of these lines with a ruler. Put your answer on the line to the right. Be sure to reduce fractions of an inch.

6 points:

15. _____ $= 2\frac{1}{8}$
16. _____ $= 1\frac{3}{8}$
17. _____ $= \frac{7}{8}$
18. _____ $= 2\frac{1}{4}$
19. _____ $= 1\frac{1}{8}$
20. _____ $= 1$

Pages 59 and 60 — 51 points

Review 26

51

Change the following mixed numbers to improper fractions.

6 points:

1. $5\frac{1}{8} = \frac{41}{8}$
2. $4\frac{1}{6} = \frac{25}{6}$
3. $6\frac{1}{9} = \frac{55}{9}$
4. $2\frac{3}{4} = \frac{11}{4}$
5. $6\frac{2}{7} = \frac{44}{7}$
6. $1\frac{1}{2} = \frac{3}{2}$

Change the following improper fractions to mixed numbers.

6 points:

7. $\frac{13}{2} = 6\frac{1}{2}$
8. $\frac{24}{6} = 4$
9. $\frac{50}{9} = 5\frac{5}{9}$
10. $\frac{41}{8} = 5\frac{1}{8}$
11. $\frac{32}{5} = 6\frac{2}{5}$
12. $\frac{18}{2} = 9$

Reduce the following fractions to lowest terms.

6 points:

13. $\frac{6}{12} = \frac{1}{2}$
14. $\frac{4}{16} = \frac{1}{4}$
15. $\frac{18}{20} = \frac{9}{10}$
16. $\frac{9}{12} = \frac{3}{4}$
17. $\frac{7}{35} = \frac{1}{5}$
18. $\frac{30}{32} = \frac{15}{16}$

Write point *B* as a mixed number; be sure to reduce the fraction.

2 points:

19. 

B = $2\frac{5}{8}$

20. 

B = $4\frac{1}{2}$

1 point:

21. Use a ruler to measure the line below.


= $2\frac{3}{4}$

1 point:

22. Factors of 35 = 5 x 7

1 point:

23. Write 607,000,000,000 in words.

six hundred seven billion

2 points:

24. 4 : 24 = 7 : 42

25. 2 : 12 = 5 : 30

1 point:

26. 1135.68 ÷ 2.8 = 405.6

1 point:

27. Write MMDXI as an Arabic number.

2511

1 point:

28. Find the average of 28, 14, 35, and 23.

25

3 points:

29. 6.04 × 9.3 = 56.172

30. 6.4 + 83 + 1.063 = 90.463

31. 9.9 − 1.378 = 8.522

2 points:

32. Round off 434 to the nearest hundred.

400

33. Round off .778931 to the nearest hundredth.

.78

2 points:

34. 4^3 = 64

35. Three to the fourth = 81

1 point:

36. If $\frac{4}{41}$ of a class is absent, what fraction is present? $\frac{37}{41}$

4 points:

37. $\frac{6}{7} + \frac{4}{7} = 1\frac{3}{7}$
38. $\frac{2}{3} - \frac{1}{4} = \frac{5}{12}$
39. $\frac{1}{4} + \frac{2}{5} = \frac{13}{20}$

40. $\frac{5}{6} - \frac{1}{3} =$ $\frac{1}{2}$

3 points:

41. Mrs. Twinkle Toes runs 2.9 miles every day, rain or shine. How far would she run during the month of September?

87 miles

42. Gus did $\frac{1}{9}$ of a job, Hank did $\frac{1}{5}$, and James did $\frac{4}{15}$. How much did they do all together? $\frac{26}{45}$

43. How much remained to be done? $\frac{19}{45}$

8 points:

44. How many feet are in a yard? 3
45. How many cups are in a pint? 2
46. How many quarts are in a gallon? 4
47. How many feet are in a mile? 5,280
48. How many days are in July? 31
49. How many days are in a leap year? 366
50. How many ounces are in a pound? 16
51. How many pounds are in a ton? 2,000

Page 61 — 22 points

Working with Mixed Numbers 3

22

Work out the following problems. One asterisk (*) means you will have an improper fraction in the answer. Two asterisks (**) mean you will have to borrow from a whole number before you subtract.

16 points:

1. $3\frac{4}{9} + 5\frac{2}{9} = 8\frac{6}{9} = 8\frac{2}{3}$
2. $9\frac{2}{5} + 8\frac{2}{5} = 17\frac{4}{5}$
3. $8\frac{3}{5} - 5\frac{1}{5} = 3\frac{2}{5}$
4. $3\frac{4}{5}$ * $+ 5\frac{2}{5} = 8\frac{6}{5} = 9\frac{1}{5}$
5. $7\frac{1}{3} + 8\frac{1}{3} = 15\frac{2}{3}$
6. $16\frac{5}{13} - 4\frac{4}{13} = 12\frac{1}{13}$
7. $17\frac{3}{7} + 6\frac{2}{7} = 23\frac{5}{7}$
8. $7\frac{1}{5}$ ** $- 4\frac{3}{5} = 3\frac{3}{5}$
9. $16\frac{5}{8} - 2\frac{4}{8} = 14\frac{1}{8}$
10. $8\frac{5}{9}$ * $+ 7\frac{6}{9} = 15\frac{11}{9} = 16\frac{2}{9}$
11. $4\frac{1}{5} + 7\frac{1}{5} = 11\frac{2}{5}$
12. $19\frac{5}{11} + 8\frac{5}{11} = 27\frac{10}{11}$
13. $6\frac{4}{11} + 8\frac{5}{11} = 14\frac{9}{11}$
14. $2\frac{1}{3}$ ** $- 1\frac{2}{3} = \frac{2}{3}$
15. $18\frac{7}{8}$ * $+ 11\frac{6}{8} = 29\frac{13}{8} = 30\frac{5}{8}$
16. $21\frac{4}{5} - 3\frac{1}{5} = 18\frac{3}{5}$

Sometimes you must change a whole number to a mixed number before you can subtract.

Example:

$$8 - 4\frac{2}{3} = 7\frac{3}{3} - 4\frac{2}{3} = 3\frac{1}{3}$$

Do the following subtraction problems. Make sure the fractions have common denominators.

3 points:

17. $6 - 2\frac{1}{7} = 3\frac{6}{7}$
18. $4 - 1\frac{3}{4} = 2\frac{1}{4}$
19. $9 - 8\frac{1}{2} = \frac{1}{2}$

Measure these lines with a ruler and put your answers on the lines to the right. Reduce fractions of an inch.

3 points:

20. _____ = $1\frac{1}{2}$
21. _____ = $1\frac{3}{4}$
22. _____ = $2\frac{1}{4}$

Page 62 — 22 points

Working with Mixed Numbers 4

22

Work out the following problems. Watch out for improper fractions — don't leave any in your answers. Also, watch for problems where you have to borrow from a whole number before you subtract.

20 points:

1. $8\frac{1}{5} + 7\frac{3}{5} = 15\frac{4}{5}$

2. $14\frac{1}{8} + 9\frac{4}{8} = 23\frac{5}{8}$

3. $47\frac{1}{9} - 6\frac{3}{9} = 40\frac{7}{9}$

4. $3 - 1\frac{4}{7} = 1\frac{3}{7}$

5. $18\frac{4}{5} - 7\frac{1}{5} = 11\frac{3}{5}$

6. $19\frac{1}{3} + 6\frac{1}{3} = 25\frac{2}{3}$

7. $10\frac{1}{3} - 4\frac{2}{3} = 5\frac{2}{3}$

8. $12 + 9\frac{3}{11} = 21\frac{3}{11}$

9. $7\frac{1}{8} - 4\frac{1}{8} = 3$

10. $10 - 1\frac{1}{9} = 8\frac{8}{9}$

11. $12\frac{2}{7} - 5\frac{1}{7} = 7\frac{1}{7}$

12. $6\frac{7}{8} - 5\frac{2}{8} = 1\frac{5}{8}$

13. $14\frac{3}{5} + 18\frac{4}{5} = 32\frac{7}{5} = 33\frac{2}{5}$

14. $8\frac{1}{3} + 3\frac{2}{3} = 11\frac{3}{3} = 12$

15. $41\frac{1}{11} - 18\frac{3}{11} = 22\frac{9}{11}$

16. $13\frac{4}{9} + 8\frac{7}{9} = 21\frac{11}{9} = 22\frac{2}{9}$

17. $17 + 18\frac{3}{10} = 35\frac{3}{10}$

18. $16\frac{2}{3} - 7\frac{1}{3} = 9\frac{1}{3}$

19. $6 - 5\frac{7}{8} = \frac{1}{8}$

20. $59\frac{2}{3} + 8\frac{2}{3} = 67\frac{4}{3} = 68\frac{1}{3}$

Measure each of these lines with a ruler. Put your answer on the line to the right. Reduce fractions of an inch.

2 points:

21. _____ = 2

22. _____ = $1\frac{1}{4}$

Page 63 — 10 points

Test 26 — Working with Mixed Numbers

10

Carefully work out the following problems.

10 points:

1. $4\frac{1}{5} + 8\frac{3}{5} = 12\frac{4}{5}$

2. $5\frac{2}{5} + 9\frac{4}{5} = 14\frac{6}{5} = 15\frac{1}{5}$

3. $9\frac{1}{10} - 4\frac{3}{10} = 4\frac{8}{10} = 4\frac{4}{5}$

4. $18 - 9\frac{3}{4} = 8\frac{1}{4}$

5. $5\frac{4}{9} - 3\frac{3}{9} = 2\frac{1}{9}$

6. $4\frac{5}{8} = \frac{15}{24}$, $-2\frac{1}{3} = \frac{8}{24}$, $2\frac{7}{24}$

7. $4 - 2\frac{1}{2} = 1\frac{1}{2}$

8. $6\frac{1}{3} - 3\frac{2}{3} = 2\frac{2}{3}$

9. $2\frac{3}{4} + 5\frac{1}{4} = 7\frac{4}{4} = 8$

10. $6\frac{6}{7} + 9\frac{4}{7} = 15\frac{10}{7} = 16\frac{3}{7}$

Page 64 — 20 points

Review Test 26

20

20 points:

1. Find the interval, and then figure out what *A* is on the following number line.

A = 35

2. Write 290,000,000,000 in words.

two hundred ninety billion

3. Factor 90 four ways. 3 x 30 9 x 10 6 x 15 5 x 18 also: 2 x 45

4. 48455 ÷ 8 = 6056 7/8

5. Find the average of 823 and 635.

729

6. Write four and seventeen thousandths in decimals.

4.017

7. 2.375 + 28 + 6.3 = 36.675

8. 93.6 − 29.463 = 64.137

9. Round off 354,265 to the nearest thousand.

354,000

10. Round off .7764592 to the nearest hundredth.

.78

11. 629 × 2.4 = 1509.6

12. Write MMDCCXLVII in Arabic numbers.

2747

13. 20.976 ÷ .57 = 36.8

14. 4^3 = 64

15. What fraction of the circle is shaded in?

4/6 or 2/3

16. If 9/10 of a house is painted, how much remains to be done? 1/10

17. Complete the ratio.

6 : 36 = 7 : 42

18. 3/5 + 1/8 = 29/40

19. Reduce the following fractions to lowest terms.

6/24 = 1/4 9/12 = 3/4

20. Change $4\frac{3}{5}$ to an improper fraction.

23/5

Page 65 — 17 points

Unit 27 — Multiplying Fractions and Mixed Numbers 1

17

To multiply fractions, first multiply the top by the top, then the bottom by the bottom. Check to make sure the answer is reduced to the lowest terms.

Work out the following problems.

Example:

$\frac{5}{6} \times \frac{3}{5} = \frac{15}{30} = \frac{1}{2}$

17 points:

1. $\frac{4}{5} \times \frac{1}{2} = \frac{4}{10} = \frac{2}{5}$
2. $\frac{3}{10} \times \frac{5}{6} = \frac{15}{60} = \frac{1}{4}$
3. $\frac{4}{9} \times \frac{6}{7} = \frac{24}{63} = \frac{8}{21}$
4. $\frac{7}{8} \times \frac{4}{11} = \frac{28}{88} = \frac{7}{22}$
5. *of* means "multiply"
   $\frac{8}{9}$ of $\frac{3}{4} = \frac{24}{36} = \frac{2}{3}$
6. $\frac{1}{4} \times \frac{8}{9} = \frac{8}{36} = \frac{2}{9}$
7. $\frac{7}{10} \times \frac{5}{14} = \frac{35}{140} = \frac{1}{4}$
8. $\frac{2}{3} \times \frac{6}{7} = \frac{12}{21} = \frac{4}{7}$
9. $\frac{5}{6} \times \frac{1}{15} = \frac{5}{90} = \frac{1}{18}$
10. $\frac{12}{13} \times \frac{1}{6} = \frac{12}{78} = \frac{2}{13}$
11. $\frac{8}{11}$ of $\frac{2}{3} = \frac{16}{33} =$ —
12. $\frac{4}{5} \times \frac{15}{16} = \frac{60}{80} = \frac{3}{4}$
13. $\frac{2}{3} \times \frac{9}{10} = \frac{18}{30} = \frac{3}{5}$
14. $\frac{11}{12} \times \frac{6}{7} = \frac{66}{84} = \frac{11}{14}$
15. $\frac{1}{9} \times \frac{3}{4} = \frac{3}{36} = \frac{1}{12}$
16. $\frac{8}{15} \times \frac{3}{4} = \frac{24}{60} = \frac{2}{5}$
17. $\frac{3}{5}$ of $\frac{10}{11} = \frac{30}{55} = \frac{6}{11}$

Page 66 —— 20 points

Multiplying Fractions and Mixed Numbers 2

20

Sometimes you can cancel before you multiply fractions. This makes the numbers smaller and easier to work with.

To cancel, look diagonally across a problem and see if you can reduce. Then multiply numerators by numerators and denominators by denominators.

Example: $\frac{7}{\cancel{8}_{2}} \times \frac{\cancel{3}^{1}}{4_{1}} = \frac{7}{3} \times \frac{1}{4} = \frac{7}{12}$

Study the next example and do the rest of the problems.

11 points:

1. $\frac{\cancel{5}^{1}}{\cancel{8}_{2}} \times \frac{\cancel{3}^{1}}{\cancel{5}_{1}} = \frac{1}{2}$
2. $\frac{4}{9} \times \frac{12}{13} = \frac{16}{39}$
3. $\frac{2}{8}$ of $\frac{4}{5} = \frac{2}{10} = \frac{1}{5}$
4. $\frac{1}{2} \times \frac{4}{5} = \frac{2}{5}$
5. $\frac{2}{3} \times \frac{9}{10} = \frac{3}{5}$
6. $\frac{5}{7}$ of $\frac{7}{10} = \frac{1}{2}$
7. $\frac{12}{13} \times \frac{1}{6} = \frac{2}{13}$
8. $\frac{2}{3} \times \frac{15}{16} = \frac{5}{8}$
9. $\frac{9}{11}$ of $\frac{2}{3} = \frac{6}{11}$
10. $\frac{4}{5}$ of $\frac{20}{21} = \frac{16}{21}$
11. $\frac{3}{7} \times \frac{7}{24} = \frac{1}{8}$

Cancel if you can and then multiply. If you come across a whole number, make it into a fraction by putting it over 1.

Example: $13 = \frac{13}{1}$

9 points:

12. $\frac{3}{4} \times \frac{12}{15} = \frac{3}{5}$
13. $\frac{2}{3} \times \frac{3}{18} = \frac{1}{9}$
14. $\frac{3}{8}$ of $16 = \frac{6}{1}$
15. $\frac{1}{2} \times 12 = \frac{6}{1}$
16. $\frac{4}{9}$ of $\frac{7}{8} = \frac{7}{18}$
17. $\frac{2}{3} \times \frac{5}{7} = \frac{10}{21}$
18. $\frac{5}{6}$ of $\frac{9}{10} = \frac{3}{4}$
19. $\frac{4}{7} \times \frac{2}{5} = \frac{8}{35}$
20. $\frac{4}{7}$ of $14 = \frac{8}{1}$

Pages 67 and 68 — 46 points

Review 27

46

Change the following mixed numbers to improper fractions.

6 points:

1. $2\frac{1}{8} = \frac{17}{8}$
2. $4\frac{1}{5} = \frac{21}{5}$
3. $1\frac{1}{8} = \frac{9}{8}$
4. $3\frac{5}{6} = \frac{23}{6}$
5. $5\frac{1}{9} = \frac{46}{9}$
6. $10\frac{2}{3} = \frac{32}{3}$

Change the following improper fractions to mixed numbers. Reduce your answers to lowest terms.

6 points:

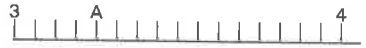
7. $\frac{13}{2} = 6\frac{1}{2}$
8. $\frac{20}{3} = 6\frac{2}{3}$
9. $\frac{45}{6} = 7\frac{1}{2}$
10. $\frac{14}{7} = 2$
11. $\frac{14}{5} = 2\frac{4}{5}$
12. $\frac{29}{8} = 4\frac{5}{8}$

4 points:

13. $4\frac{4}{5} + 5\frac{4}{5} = 9\frac{8}{5} = 10\frac{3}{5}$
14. $6\frac{1}{3} - 4\frac{2}{3} = 1\frac{2}{3}$
15. $5\frac{1}{9} + 6\frac{8}{9} = 12$
16. $6\frac{1}{9} - 1\frac{2}{9} = 4\frac{8}{9}$

1 point:

17. Write point *A* as a mixed number. Reduce your answer to lowest terms.



A = $3\frac{1}{4}$

2 points:

18. Factors of 50 = 2 x 25 5 x 10

1 point:

19. Write twenty-one billion in numbers.

21,000,000,000

1 point:

20. 6 : 72 = 8: 96

1 point:

21. 164.84 ÷ 2.6 = 63.4

1 point:

22. Find the average of 99 and 103.

101

1 point:

23. 43.51 × .73 = 31.7623

1 point:

24. Write 21.016 in words.

twenty-one and sixteen thousandths

2 points:

25. 8.3 + 21 + 36.94 = 66.24

26. 18.9 − 9.314 = 9.586

5 points:

27. Circle the measures used for weight.

centimeters
inches
(pounds)
miles
(ounces)
(grams)
millimeters
(kilograms)
(tons)
liters

2 points:

28. Round off 561 to the nearest hundred.

600

29. Round off .743294 to the nearest thousandth.

.743

1 point:

30. Write 2,498 in Roman numerals.

MMCDXCVIII

1 point:

31. Four cubed + five squared = 89

1 point:

32. Figure out what *B* is on the following number line.

B = 26

Reduce to lowest terms.

5 points:

33. $\frac{9}{27} = \frac{1}{3}$ 34. $\frac{18}{24} = \frac{3}{4}$

35. $\frac{4}{7} + \frac{5}{7} = \frac{9}{7} = 1\frac{2}{7}$

36. $\frac{6}{7} - \frac{2}{5} = \frac{16}{35}$

37. $\frac{3}{4} + \frac{1}{5} = \frac{19}{20}$

2 points:

38. Mrs. Emerson earns $11,220 a year. How much does she earn each month?

$935 each month

39. Cindy weighs 37 pounds. Her mother weighs four times that much. How much does her mother weigh?

148 pounds

2 points:

40. Circle the metric measure you would use to weigh an elephant.

milligrams
grams
(kilograms)

41. Which metric measure would you use to weigh a pencil?

grams

Page 69 — 15 points

Multiplying Fractions and Mixed Numbers 3

15

Work out the following multiplication problems. First, change the mixed numbers to improper fractions; then cancel if you can. Make sure the answer is reduced to lowest terms.

Example:

$1\frac{3}{4} \times 2\frac{4}{7} = \frac{\overset{1}{\cancel{7}}}{\underset{2}{\cancel{4}}} \times \frac{\overset{9}{\cancel{18}}}{\underset{1}{\cancel{7}}} = \frac{9}{2} = 4\frac{1}{2}$

8 points:

1. $3\frac{1}{4} \times 4\frac{4}{5} = \frac{13}{4} \times \frac{24}{5} = 15\frac{3}{5}$

2. $5\frac{1}{2} \times 3\frac{6}{11} = 19\frac{1}{2}$

3. $\frac{3}{4} \times 1\frac{1}{3} = 1$

4. $4\frac{1}{5} \times 5 = 21$

5. $8\frac{1}{3} \times 6\frac{2}{5} = 53\frac{1}{3}$

6. $6\frac{2}{3} \times 2\frac{1}{10} = 14$

7. $1\frac{1}{2} \times 1\frac{6}{7} = 2\frac{11}{14}$

8. $2\frac{1}{4} \times 1\frac{1}{9} = 2\frac{1}{2}$

Now work out the following multiplication problems. Make sure the answer is reduced to lowest terms.

5 points:

9. $\frac{2}{3} \times 4\frac{1}{2} = 3$

10. $\frac{1}{7} \times 15 = 2\frac{1}{7}$

11. $6\frac{1}{8} \times \frac{5}{7} = 4\frac{3}{8}$

12. $\frac{2}{3} \times \frac{5}{16} = \frac{5}{24}$

13. $8\frac{1}{8} \times 8 = 65$

Now do these problems.

2 points:

14. If it takes $1\frac{3}{4}$ yards of fabric to make 1 dress, how much fabric is needed to make 8 dresses?

14 yards

15. The distance around a running track is $\frac{1}{4}$ of a mile. If you run around the track 14 times, how many miles will you run?

$3\frac{1}{2}$ miles

Page 70 —— 23 points

Multiplying Fractions and Mixed Numbers 4

23

21 points:

Do the following multiplication problems. Reduce the answers to lowest terms.

1. $\frac{8}{9} \times 3\frac{3}{4} =$ $3\frac{1}{3}$
2. $4\frac{2}{5} \times 1\frac{7}{8} =$ $8\frac{1}{4}$
3. $\frac{4}{5}$ of $\frac{9}{10} =$ $\frac{18}{25}$
4. $2\frac{5}{9} \times \frac{3}{4} =$ $1\frac{11}{12}$
5. $\frac{1}{8}$ of 12 = $1\frac{1}{2}$
6. $\frac{2}{9} \times \frac{3}{4} =$ $\frac{1}{6}$
7. $2\frac{1}{5} \times 4\frac{3}{8} =$ $9\frac{5}{8}$
8. $\frac{4}{7} \times \frac{14}{15} =$ $\frac{8}{15}$
9. $\frac{11}{12} \times 6\frac{3}{4} =$ $6\frac{3}{16}$
10. $1\frac{3}{13} \times 4\frac{1}{6} =$ $5\frac{5}{39}$
11. $\frac{2}{7} \times 28 =$ 8
12. $2\frac{4}{9} \times \frac{18}{19} =$ $2\frac{6}{19}$
13. $\frac{3}{4}$ of $\frac{2}{7} =$ $\frac{3}{14}$
14. $\frac{1}{2} \times 6 =$ 3
15. $\frac{7}{8} \times \frac{2}{7} =$ $\frac{1}{4}$
16. $\frac{3}{8}$ of $\frac{5}{7} =$ $\frac{15}{56}$
17. $\frac{9}{10}$ of 30 = 27
18. $\frac{1}{2} \times 2\frac{14}{15} =$ $1\frac{7}{15}$
19. $6\frac{2}{3} \times 8\frac{1}{10} =$ 54
20. $\frac{4}{9}$ of $2\frac{2}{3} =$ $1\frac{5}{27}$
21. $\frac{1}{4}$ of 12 = 3

Now do these problems.

2 points:

22. It takes $1\frac{3}{4}$ cups of sugar to make a batch of chocolate chip cookies. How much sugar is needed to make 4 batches of cookies?

7 cups of sugar

23. Uncle Frank wants to give \$2.50 ($2\frac{1}{2}$ dollars) to each of his 10 nephews and nieces for Christmas. How much money will he be giving all together?

$25.00

Page 71 — 10 points

Test 27—Multiplying Fractions and Mixed Numbers

10

10 points:

Do the following multiplication problems. Make sure each answer is reduced to the lowest terms.

1. $\frac{2}{3} \times \frac{3}{4} =$ $\frac{1}{2}$
2. $\frac{3}{10} \times \frac{5}{6} =$ $\frac{1}{4}$
3. $\frac{4}{5} \times \frac{3}{8} =$ $\frac{3}{10}$
4. $\frac{9}{11}$ of 33 = 27
5. $\frac{4}{5}$ of 20 = 16
6. $\frac{7}{8}$ of $\frac{4}{5} =$ $\frac{7}{10}$
7. $1\frac{2}{3} \times 6\frac{1}{2} =$ $10\frac{5}{6}$
8. $4\frac{1}{5} \times 2\frac{3}{4} =$ $11\frac{11}{20}$
9. $9\frac{1}{2} \times 1\frac{2}{5} =$ $13\frac{3}{10}$
10. $7\frac{3}{4} \times 2\frac{5}{6} =$ $21\frac{23}{24}$

Page 72 — 23 points

Review Test 27

23

23 points:

1. Figure out what *A* is on the following number line.

A = 21

2. Write four hundred thirty-five million in numbers.

435,000,000

3. Factor 40 three ways. 4 × 10

5 × 8 2 × 20

4. 65754 ÷ 8 = $8219\frac{1}{4}$

5. Find the average of 10, 12, 16, 13, and 19.

14

6. Write 8.13 in words.

eight and thirteen hundredths

7. 4.589 + 35 + 1.8 = 41.389

8. 75.8 − 28.5 = 47.3

9. Round off 372,586,211 to the nearest million.

373,000,000

10. Round off .42837941 to the nearest thousandth.

.428

11. 2.71 × 3.8 = 10.298

12. Write 3,947 in Roman numerals.

MMMCMXLVII

13. 300.94 ÷ 8.2 = 36.7

14. Five cubed = 125

15. What fraction of the circle is shaded in?

$\frac{1}{8}$

16. If $\frac{14}{17}$ of a class is men, what fraction is women? $\frac{3}{17}$

17. Complete the ratio.

4 : 36 = 5 : 45

18. $\frac{5}{6} - \frac{2}{9} = \frac{11}{18}$

19. Reduce the following fractions to lowest terms.

$\frac{3}{35} = \frac{3}{35}$ $\frac{14}{16} = \frac{7}{8}$

20. Change $2\frac{5}{9}$ to an improper fraction.

$\frac{23}{9}$

21. $7\frac{5}{7} + 8\frac{6}{7} = 16\frac{4}{7}$

22. $5\frac{1}{3} - 2\frac{2}{3} = 2\frac{2}{3}$

23. Write point *B* as a mixed number. Reduce your answer to the lowest terms.

B = $3\frac{1}{4}$

Page 73 — 12 points

Unit 28 — Dividing Fractions and Mixed Numbers 1

12

Once you know how to multiply fractions and mixed numbers, dividing them is easy. Just turn the second fraction upside down and multiply. Cancel if you can, but make sure you don't cancel until the second fraction is turned upside down.

Example:

copy

$\frac{2}{7} \div \frac{11}{14} = \frac{2}{7} \times \frac{14}{11}$ → now cancel and then multiply → $\frac{2}{\cancel{7}_{1}} \times \frac{\cancel{14}^{2}}{11} = \frac{4}{11}$ Answer

turn upside down

Now try the following problems in division of fractions.

12 points:

1. $\frac{2}{9} \div \frac{2}{3} = \frac{2}{9} \times \frac{3}{2} = \frac{1}{3}$
2. $\frac{3}{10} \div \frac{4}{5} = \frac{3}{10} \times \frac{5}{4} = \frac{3}{8}$
3. $\frac{1}{8} \div \frac{2}{3} = \frac{1}{8} \times \frac{3}{2} = \frac{3}{16}$
4. $\frac{4}{7} \div \frac{5}{7} = \frac{4}{7} \times \frac{7}{5} = \frac{4}{5}$
5. $\frac{2}{5} \div \frac{7}{10} = \frac{2}{5} \times \frac{10}{7} = \frac{4}{7}$
6. $\frac{6}{7} \div \frac{12}{13} = \frac{6}{7} \times \frac{13}{12} = \frac{13}{14}$
7. $\frac{2}{15} \div \frac{4}{5} = \frac{2}{15} \times \frac{5}{4} = \frac{1}{6}$
8. $\frac{5}{12} \div \frac{5}{6} = \frac{5}{12} \times \frac{6}{5} = \frac{1}{2}$
9. $\frac{5}{6} \div \frac{7}{8} = \frac{5}{6} \times \frac{8}{7} = \frac{20}{21}$
10. $\frac{1}{3} \div \frac{4}{5} = \frac{1}{3} \times \frac{5}{4} = \frac{5}{12}$
11. $\frac{2}{15} \div \frac{2}{5} = \frac{2}{15} \times \frac{5}{2} = \frac{1}{3}$
12. $\frac{4}{11} \div \frac{9}{22} = \frac{4}{11} \times \frac{22}{9} = \frac{8}{9}$

Page 74 — 15 points

Dividing Fractions and Mixed Numbers 2

15

To divide fractions, turn the second fraction upside down, cancel if you can, and multiply.

Do the following problems. If any of the answers are improper (top heavy), change them to mixed numbers.

8 points:

1. $\frac{3}{8} \div \frac{3}{4} = \frac{3}{8} \times \frac{4}{3} = \frac{1}{2}$
2. $\frac{4}{7} \div \frac{1}{28} = \frac{4}{7} \times \frac{28}{1} = 16$
3. $\frac{2}{9} \div \frac{18}{27} = \frac{1}{3}$
4. $\frac{3}{5} \div \frac{17}{20} = \frac{12}{17}$
5. $\frac{6}{7} \div \frac{13}{14} = \frac{12}{13}$
6. $\frac{2}{11} \div \frac{20}{33} = \frac{3}{10}$
7. $\frac{9}{13} \div \frac{12}{13} = \frac{3}{4}$
8. $\frac{5}{21} \div \frac{5}{7} = \frac{1}{3}$

Work out the following problems. First change the mixed numbers to improper fractions; then divide. Cancel if you can.

Example:

$3\frac{1}{3} \div 4\frac{4}{9} = \frac{10}{3} \div \frac{40}{9} = \frac{\cancel{10}^{1}}{\cancel{3}_{1}} \times \frac{\cancel{9}^{3}}{\cancel{40}_{4}} = \frac{3}{4}$ Answer

7 points:

9. $2\frac{1}{2} \div 3\frac{3}{4} = \frac{5}{2} \div \frac{15}{4} = \frac{5}{2} \times \frac{4}{15} = \frac{2}{3}$
10. $6\frac{1}{8} \div 7\frac{7}{10} = \frac{35}{44}$
11. $1\frac{1}{2} \div 2\frac{3}{4} = \frac{6}{11}$
12. $\frac{2}{3} \div 1\frac{1}{3} = \frac{1}{2}$
13. $4\frac{1}{6} \div 7\frac{1}{7} = \frac{7}{12}$
14. $3\frac{2}{3} \div 5\frac{1}{2} = \frac{2}{3}$
15. $8\frac{4}{7} \div 11\frac{3}{7} = \frac{3}{4}$

Pages 75 and 76 — 39 points

Review 28

39

6 points:

1. $1\frac{2}{3} \times 3\frac{1}{4} = 5\frac{5}{12}$
2. $\frac{4}{5} \times 2\frac{1}{8} = 1\frac{7}{10}$
3. $4\frac{3}{4} \times \frac{4}{19} = 1$
4. $2\frac{2}{3} \times 4\frac{1}{4} = 11\frac{1}{3}$
5. $\frac{3}{4} \times \frac{4}{5} = \frac{3}{5}$
6. $\frac{8}{9}$ of 45 = 40

1 point:

7. Use a ruler to measure the line.

$= 2\frac{1}{4}$

Reduce the following to lowest terms.

2 points:

8. $\frac{4}{20} = \frac{1}{5}$
9. $\frac{12}{16} = \frac{3}{4}$

2 points:

10. $7\frac{1}{7} - 2\frac{4}{7} = 4\frac{4}{7}$
11. $6\frac{3}{5} + 7\frac{4}{5} = 14\frac{2}{5}$

1 point:

12. Write $5\frac{3}{5}$ as an improper fraction. $\frac{28}{5}$

1 point:

13. If $\frac{4}{10}$ are wrong, how many are right? $\frac{3}{5}$

3 points:

14. $\frac{4}{7} + \frac{5}{7} = 1\frac{2}{7}$
15. $\frac{8}{9} - \frac{1}{6} = \frac{13}{18}$
16. $\frac{2}{3} + \frac{1}{8} = \frac{19}{24}$

2 points:

17. $2^5 = 32$
18. Ten squared = 100

2 points:

19. 151.536 ÷ .42 = 360.8
20. 19.8 × .53 = 10.494

1 point:

21. Write CMLXXVI as an Arabic number. 976

1 point:

22. Find the average of 75 and 83. 79

2 points:

23. Round off .4738921 to the nearest thousandth. .474
24. Round off 749 to the nearest hundred. 700

2 points:

25. 84.3 + 2.73 + 11 = 98.03
26. 80.5 − 21.413 = 59.087

1 point:

27. Write two and seventeen hundredths in decimals. 2.17

1 point:

28. Write 908,000,000,000 in words. nine hundred eight billion

2 points:

29. A jet fighter goes 1,258 miles an hour. How far can it go in 5 hours at this speed? 6,290 miles
30. A new car gets 15 miles to the gallon. There are 12.8 gallons left in the tank, and 194 miles to the nearest gas station. Will the car make it to the station? no (It has gas for only 192 miles)

3 points:

31. Circle the best metric measure for your weight.
    milligram
    gram
    (kilogram)
32. Circle the metric measure you would use to measure milk for a cake mix.
    (milliliter)
    liter

33. Circle the metric measure you would use to measure the length of a classroom.

millimeter
centimeter
(meter)
kilometer

6 points:

34. How many seconds are in a minute? 60

35. How many hours are in a day? 24

36. How many quarts are in a gallon? 4

37. How many years are in a decade? 10

38. How many years are in a century? 100

39. How many cents are in a quarter? 25

Page 77 — 14 points

Dividing Fractions and Mixed Numbers 3

14

Work out the following problems. If any of the answers are improper, change them to mixed numbers.

14 points:

1. $\frac{3}{7} \div \frac{9}{14} =$ $\frac{2}{3}$

2. $5\frac{4}{5} \div 6\frac{1}{10} =$ $\frac{58}{61}$

3. $3\frac{3}{10} \div 6\frac{3}{5} =$ $\frac{1}{2}$

4. $\frac{5}{6} \div \frac{9}{14} =$ $1\frac{8}{27}$

5. $12 \div \frac{6}{7} =$ 14

6. $\frac{5}{6} \div \frac{12}{13} =$ $\frac{65}{72}$

7. $2\frac{1}{4} \div \frac{3}{4} =$ 3

8. $8\frac{4}{7} \div 2\frac{1}{7} =$ 4

9. $\frac{2}{9} \div \frac{5}{6} =$ $\frac{4}{15}$

10. $10 \div \frac{3}{4} =$ $13\frac{1}{3}$

11. $9\frac{1}{3} \div 1\frac{1}{6} =$ 8

12. $\frac{4}{11} \div \frac{21}{22} =$ $\frac{8}{21}$

13. $16 \div \frac{1}{2} =$ 32

14. $4\frac{3}{4} \div 9\frac{1}{2} =$ $\frac{1}{2}$

Page 78 —— 14 points

Dividing Fractions and Mixed Numbers 4

14

Work out the following problems. Be careful—some are division problems, and some are multiplication problems.

14 points:

1. $10 \div 2\frac{1}{4} =$ $4\frac{4}{9}$
2. $\frac{4}{21} \div \frac{11}{14} =$ $\frac{8}{33}$
3. $1\frac{6}{7} \div 3\frac{5}{7} =$ $\frac{1}{2}$
4. $18 \times 2\frac{1}{6} =$ 39
5. $\frac{2}{9} \div \frac{11}{12} =$ $\frac{8}{33}$
6. $1\frac{2}{9} \times \frac{2}{11} =$ $\frac{2}{9}$
7. $6\frac{3}{7} \div \frac{9}{14} =$ 10
8. $4\frac{1}{5} \div 2\frac{7}{10} =$ $1\frac{5}{9}$
9. $8 \div \frac{1}{4} =$ 32
10. $\frac{2}{3} \div \frac{1}{3} =$ 2
11. $15 \div \frac{1}{2} =$ 30
12. $3\frac{3}{4} \times \frac{4}{5} =$ 3
13. $8\frac{1}{3} \div 2\frac{2}{9} =$ $3\frac{3}{4}$
14. $9\frac{2}{7} \div \frac{5}{7} =$ 13

Page 79 — 10 points

Test 28—Dividing Fractions and Mixed Numbers

10

Work out the following problems. Make sure the answers are reduced to the lowest terms and, if necessary, turned into mixed numbers.

10 points:

1. $\frac{6}{11} \div \frac{21}{22} =$ $\frac{4}{7}$
2. $\frac{7}{8} \div 14 =$ $\frac{1}{16}$
3. $\frac{8}{9} \div \frac{1}{12} =$ $10\frac{2}{3}$
4. $\frac{5}{13} \div \frac{10}{11} =$ $\frac{11}{26}$
5. $\frac{3}{5} \div 2\frac{1}{4} =$ $\frac{4}{15}$
6. $\frac{2}{9} \div \frac{10}{27} =$ $\frac{3}{5}$
7. $12 \div \frac{4}{5} =$ 15
8. $2\frac{1}{2} \div 4\frac{2}{3} =$ $\frac{15}{28}$
9. $1\frac{1}{3} \div \frac{2}{5} =$ $3\frac{1}{3}$
10. $\frac{3}{8} \div 42 =$ $\frac{1}{112}$

Page 80 — 24 points

Review Test 28

24

24 points:

1. Find out what *A* is on the following number line.

A = 42

2. Write 922,000,000,000,000 in words.

nine hundred twenty-two trillion

3. Factor 60 four ways. 2x30 3x20 5x12 4x15 also: 10x6

4. 48218 ÷ 8 = $6027\frac{1}{4}$

5. Find the average of 822 and 900.

861

6. Write twelve and seven thousandths in decimals.

12.007

7. 509 + 2.7 + 1.35 = 513.05

8. 63.2 − 45.189 = 18.011

9. Round off 735,981 to the nearest thousand.

736,000

10. Round off 76.479315 to the nearest tenth.

76.5

11. 685 × .23 = 157.55

12. Write MMMDCXLIV in Arabic numbers.

3,644

13. 105.57 ÷ 2.7 = 39.1

14. 4^4 = 256

15. What fraction of the circle is shaded in?

$\frac{4}{6}$ or $\frac{2}{3}$

16. If $\frac{17}{20}$ of a test is wrong, what fraction is right? $\frac{3}{20}$

17. Complete the ratio.

5 : 40 = 7 : 56

18. $\frac{3}{8} + \frac{1}{3} = \frac{17}{24}$

19. Reduce the following fractions to lowest terms.

$\frac{8}{40} = \frac{1}{5}$ $\frac{15}{20} = \frac{3}{4}$

20. Change $7\frac{1}{3}$ to an improper fraction.

$\frac{22}{3}$

21. $9\frac{8}{9} + 1\frac{5}{9} = 10\frac{13}{9} = 11\frac{4}{9}$

22. $4\frac{2}{7} - 2\frac{4}{7} = 1\frac{5}{7}$

23. Write point *B* as a mixed number. Reduce your answer to lowest terms.

B = $7\frac{1}{2}$

24. $\frac{3}{8}$ of 24 = 9

Page 81 — 32 points

Unit 29 — Fractions, Decimals, and Percent 1

32

A *percent sign* is made like this: %. *Percent* means "hundredths" or "out of one hundred," so 23% is the same as .23 and $\frac{23}{100}$. 8% is the same as .08 and $\frac{8}{100}$.

Write the following percents as decimal fractions and as fractions.

12 points:

1. 45% = .45 = $\frac{45}{100}$
2. 99% = .99 = $\frac{99}{100}$
3. 21% = .21 = $\frac{21}{100}$
4. 78% = .78 = $\frac{78}{100}$
5. 33% = .33 = $\frac{33}{100}$
6. 87% = .87 = $\frac{87}{100}$

Write the following fractions as decimal fractions and then as percents.

12 points:

7. $\frac{13}{100}$ = .13 = 13 %
8. $\frac{45}{100}$ = .45 = 45 %
9. $\frac{25}{100}$ = .25 = 25 %
10. $\frac{75}{100}$ = .75 = 75 %
11. $\frac{50}{100}$ = .50 = 50 %
12. $\frac{90}{100}$ = .90 = 90 %

Any fraction can be changed to a percent. But first you must change it to a decimal.

To change a fraction to a decimal, divide the bottom of the fraction into the top. Add a decimal point and two zeroes.

Example:

Fraction

$\frac{1}{4} \rightarrow 4\overline{)1.00}$ .25

8
20
20
00

$\frac{1}{4}$ = .25

To change the decimal to a percent, move the decimal point two places to the right and add the percent sign (%).

Example:

Decimal → Percent

.25 → .25 = 25%

Note that everything to the left of the decimal is a whole number, so 25. and 25 are the same.

Change the following fractions first to decimals and then to percents.

8 points:

	Fraction	Decimal	Percent		Fraction	Decimal	Percent
13.	$\frac{3}{4}$ =	.75	= 75 %	15.	$\frac{1}{2}$ =	.50	= 50 %
14.	$\frac{4}{5}$ =	.80	= 80 %	16.	$\frac{3}{5}$ =	.60	= 60 %

Page 82 —— 20 points

Fractions, Decimals, and Percent 2

20

Change each of the following fractions to a decimal; then change the decimal to a percent.

Example:

Fraction		Decimal	Percent
$\frac{1}{4}$ =	$4\overline{)1.00}$:25, 8, 20, 20	.25	25%

An asterisk (*) after a fraction means there will be a remainder when you divide to the hundredths place. Write the remainder as a fraction, move the decimal over two places to the right, and add the percent sign.

Example:

Fraction		Decimal	Percent
$\frac{1}{3}$ * =	$3\overline{)1.00}$ .33, 9, 10, 9, $\frac{1}{3}$	$.33\frac{1}{3}$	$33\frac{1}{3}$ %

20 points:

	Fraction	Decimal	Percent
1.	$\frac{1}{2}$	.50	50 %
2.	$\frac{2}{5}$	.40	40 %
3.	$\frac{3}{4}$	.75	75 %
4.	$\frac{2}{3}$ *	$.66\frac{2}{3}$	$66\frac{2}{3}$
5.	$\frac{3}{10}$	.30	30 %

	Fraction	Decimal	Percent
6.	$\frac{1}{8}$ *	$.12\frac{1}{2}$	$12\frac{1}{2}$ %
7.	$\frac{3}{8}$ *	$.37\frac{1}{2}$	$37\frac{1}{2}$ %
8.	$\frac{5}{8}$ *	$.62\frac{1}{2}$	$62\frac{1}{2}$ %
9.	$\frac{7}{8}$ *	$.87\frac{1}{2}$	$87\frac{1}{2}$ %
10.	$\frac{5}{5}$	1.00	100%

Pages 83 and 84 — 42 points

Review 29

42

11 points:

1. $\frac{4}{9} \div \frac{5}{6} = \frac{4}{9} \times \frac{6}{5} = \frac{8}{15}$
2. $\frac{4}{11} \div \frac{15}{22} = \frac{4}{11} \times \frac{22}{15} = \frac{8}{15}$
3. $2\frac{1}{8} \div 5\frac{2}{3} = \frac{17}{8} \times \frac{3}{17} = \frac{3}{8}$
4. $5\frac{2}{5} \div \frac{11}{15} = \frac{27}{5} \times \frac{15}{11} = \frac{81}{11} = 7\frac{4}{11}$
5. $\frac{6}{7} \times 1\frac{1}{6} = \frac{6}{7} \times \frac{7}{6} = 1$
6. $3\frac{1}{8} \times 0 = \frac{25}{8} \times 0 = 0$
7. $\frac{9}{10} \times 2\frac{1}{7} = \frac{9}{10} \times \frac{15}{7} = \frac{27}{14} = 1\frac{13}{14}$
8. $8\frac{1}{3} \div 4\frac{1}{6} = \frac{25}{3} \times \frac{6}{25} = 2$
9. $\frac{3}{4} \div \frac{15}{16} = \frac{3}{4} \times \frac{16}{15} = \frac{4}{5}$
10. $\frac{2}{9}$ of 81 $= \frac{2}{9} \times \frac{81}{1} = 18$
11. $\frac{9}{10} \times \frac{2}{3} = \frac{3}{5}$

1 point:

12. Use a ruler to measure this line.

$= 2\frac{1}{2}$

Reduce the following to the lowest terms.

2 points:

13. $\frac{14}{20} = \frac{7}{10}$ 14. $\frac{9}{81} = \frac{1}{9}$

1 point:

15. Write $9\frac{1}{7}$ as an improper fraction. $\frac{64}{7}$

3 points:

16. $\frac{2}{3} + \frac{2}{3} = \frac{4}{3} = 1\frac{1}{3}$
17. $\frac{9}{10} - \frac{2}{3} = \frac{7}{30}$
18. $\frac{2}{5} + \frac{3}{8} = \frac{31}{40}$

2 points:

19. Two to the fifth = 32
20. 9^2 = 81

1 point:

21. 14.906 − .58 = 14.326

1 point:

22. 37.9 × 41 = 1553.9

1 point:

23. Write 1,029 in Roman numerals. MXXIX

1 point:

24. Find the average of 88, 39, and 41. 56

2 points:

25. 18.6 + 2.971 = 21.571
26. 68 − 2.47 = 65.53

2 points:

27. Round off 4.93841 to the nearest hundredth. 4.94
28. Round off 57,358 to the nearest thousand. 57,000

1 point:

29. Write 46.019 in words. forty-six and nineteen thousandths

8 points:

30. Circle the measures of distance.
millimeters, inches, gallons, tons, miles, kilometers, centimeters, yards, cups, liters, grams

31. Circle the metric measure you would use to weigh a feather.
milligram, gram, kilogram

1 point:

32. Circle the metric measure you would use to measure the distance from Boston to New York.

millimeter
centimeter
meter
(kilometer)

3 points:

33. How many quarts are in 4 gallons? 16

34. How many feet are in a mile? 5,280

35. How many days are in May? 31

1 point:

36. Mr. Glenroy took his wife and five children out to a movie. All the children were over 12 and had to pay the full price. All the tickets together cost $24.50. How much did each ticket cost?

$3.50

1 point:

37. A Roman woman lived from the year CXXXVI until CCXIV. How old was she when she died? Answer in Arabic numbers.

214 − 136 = 78 years old

Page 85 — 38 points

Fractions, Decimals, and Percent 3

38

Fill in the table below by finding fractions, decimals, and percents.

	Fraction	Decimal	Percent
8 points:	$\frac{1}{4}$	.25	25%
1.	$\frac{3}{4}$	.75	75 %
2.	$\frac{1}{2}$	.50	50 %
3.	$\frac{1}{3}$	$.33\frac{1}{3}$	$33\frac{1}{3}$ %
4.	$\frac{2}{3}$	$.66\frac{2}{3}$	$66\frac{2}{3}$ %

Be sure to reduce these fractions to the lowest terms.

	Fraction	Decimal	Percent
16 points:	$\frac{1}{5}$	.20	20 %
6.	$\frac{2}{5}$	.40	40 %
7.	$\frac{3}{5}$	.60	60 %
8.	$\frac{4}{5}$	.80	80 %

	Fraction	Decimal	Percent
9.	$\frac{9}{10}$	.90	90%
10.	$\frac{1}{10}$	.10	10%
11.	$\frac{1}{20}$	.05	5%
12.	$\frac{3}{20}$	.15	15%

Work these out to the hundredths place and include the remainder as a fraction in the decimal and in the percent.

	Fraction	Decimal	Percent
12 points:	$\frac{1}{8}$	$.12\frac{1}{2}$	$12\frac{1}{2}$ %
13.	$\frac{3}{8}$	$.37\frac{1}{2}$	$37\frac{1}{2}$ %
14.	$\frac{5}{8}$	$.62\frac{1}{2}$	$62\frac{1}{2}$ %
15.	$\frac{7}{8}$	$.87\frac{1}{2}$	$87\frac{1}{2}$ %

	Fraction	Decimal	Percent
16.	$\frac{8}{8}$	1.00	100 %
17.	$\frac{7}{20}$	.35	35 %
18.	$\frac{9}{20}$	.45	45 %

Solve the following two word problems.

2 points:

19. A baseball player got 3 hits out of 8 times at bat. What is his batting average as a decimal?

.375

20. What percent of the time did he hit?

$37\frac{1}{2}$ % of the time

Page 86 — 42 points

Fractions, Decimals, and Percent 4

42

Fill in the table below by finding fractions, decimals, and percents. If you have a remainder after dividing to the hundredths place, leave it as a fraction and include it in the decimal and in the percent. Remember to reduce the fractions to the lowest terms.

40 points:

	Fraction	Decimal	Percent
1.	$\frac{1}{2}$	.50	50%
2.	$\frac{1}{4}$	.25	25%
3.	$\frac{3}{4}$	.75	75%
4.	$\frac{1}{3}$	$.33\frac{1}{3}$	$33\frac{1}{3}\%$
5.	$\frac{2}{3}$	$.66\frac{2}{3}$	$66\frac{2}{3}\%$
6.	$\frac{3}{3}$	1.00	100%
7.	$\frac{1}{5}$	.20	20%
8.	$\frac{2}{5}$	.40	40%
9.	$\frac{3}{5}$	.60	60%
10.	$\frac{4}{5}$	.80	80%

	Fraction	Decimal	Percent
11.	$\frac{99}{100}$	.99	99%
12.	$\frac{1}{100}$	.01	1%
13.	$\frac{3}{10}$	.30	30%
14.	$\frac{1}{8}$	$.12\frac{1}{2}$	$12\frac{1}{2}\%$
15.	$\frac{3}{8}$	$.37\frac{1}{2}$	$37\frac{1}{2}\%$
16.	$\frac{5}{8}$	$.62\frac{1}{2}$	$62\frac{1}{2}\%$
17.	$\frac{7}{8}$	$.87\frac{1}{2}$	$87\frac{1}{2}\%$
18.	$\frac{11}{20}$	.55	55%
19.	$\frac{9}{10}$	.90	90%
20.	$\frac{7}{10}$	.70	70%

2 points:

Now see if you can solve the two word problems below.

21. A baseball player gets 7 hits out of 26 times at bat. What is his batting average? (Divide to the ten-thousandths place and round off to the nearest thousandth.)

.269

22. What percent of the time did he hit?

$26\frac{9}{10}\%$ of the time

Page 87 — 20 points

Test 29 — Fractions, Decimals, and Percent

20

Fill in the table with the equivalent fractions, decimals, and percents. If you have a remainder after dividing to the hundredths place, leave it as a fraction and include it in the decimal and in the percent. Remember when finding the fraction to reduce it to the lowest terms.

20 points:

	Fraction	Decimal	Percent
1.	$\frac{1}{4}$	.25	25%
2.	$\frac{3}{8}$	$.37\frac{1}{2}$	$37\frac{1}{2}\%$
3.	$\frac{4}{5}$	.80	80%
4.	$\frac{1}{3}$	$.33\frac{1}{3}$	$33\frac{1}{3}\%$
5.	$\frac{9}{10}$	.90	90%
6.	$\frac{3}{4}$	.75	75%
7.	$\frac{2}{3}$	$.66\frac{2}{3}$	$66\frac{2}{3}\%$
8.	$\frac{2}{5}$	.40	40%
9.	$\frac{1}{10}$	.10	10%
10.	$\frac{59}{100}$	.59	59%

Page 88 — 25 points

Review Test 29

25

25 points:

1. Figure out what *A* is on the following number line.

A = 24

2. Write five hundred thousand in numbers.

500,000

3. Factor 88 three ways. 8 x 11

4 x 22 2 x 44

4. 21398 ÷ 7 = 3056 $\frac{6}{7}$

5. Find the average of 19, 23, and 15.

19

6. Write 6.11 in words.

six and eleven hundredths

7. 28.491 + 3.66 + 88 = 120.151

8. 47.3 − 29.115 = 18.185

9. Round off 681,499,216 to the nearest million.

681,000,000

10. Round off 88.935711 to the nearest one.

89.

11. 8.39 × .62 = 5.2018

12. Write 2,389 in Roman numerals.

MMCCCLXXXIX

13. 26.372 ÷ .38 = 69.4

14. Three cubed = 27

15. What fraction of the circle is shaded in?

$\frac{4}{8}$ or $\frac{1}{2}$

16. If $\frac{13}{15}$ of a hotel is filled, what fraction is empty? $\frac{2}{15}$

17. Complete the ratio.

9 : 54 = 10 : 60

18. $\frac{9}{10} - \frac{2}{3} = \frac{7}{10}$

19. Reduce the following fractions to lowest terms.

$\frac{6}{24} = \frac{1}{4}$ $\frac{20}{22} = \frac{10}{11}$

20. Change $6\frac{2}{3}$ to an improper fraction.

$\frac{20}{3}$

21. $4\frac{3}{5} + 4\frac{3}{5} = 8\frac{6}{5} = 9\frac{1}{5}$

22. $5\frac{1}{9} - 2\frac{3}{9} = 2\frac{7}{9}$

23. Write point *B* as a mixed number. Reduce your answer to lowest terms.

B = $8\frac{1}{4}$

24. $4\frac{5}{6} \times 2\frac{9}{10} = 14\frac{1}{60}$

25. $\frac{1}{7} + \frac{16}{21} = \frac{3}{16}$

Page 89 — 11 points

Unit 30 — Percent 1

11

Percent means "hundredths." To find the percent of something, you change the percent to a decimal and multiply.

Example:

25% of 83 =

.25 × 83 =

$$\begin{array}{r} 83 \\ \times .25 \\ \hline 415 \\ 166 \\ \hline 20.75 \end{array}$$

Answer

Work out the following problems.

10 points:

1. 25% of 145 = 36.25
2. 18% of 64 = 11.52
3. 99% of 200 = 198
4. 65% of 128 = 83.2
5. 50% of 44 = 22
   (Can you think of a short cut for this one?)
6. 75% of 88 = 66
7. 5% of 64 = 3.2
   (Remember to add the zero.)
8. 12% of 214 = 25.68
9. 49% of 1000 = 490
10. 2% of 215 = 4.3
    (Remember to add the zero.)

Now solve this word problem.

1 point

11. A woman made $25,000 a year. She had to pay 32% of that in taxes. How much was her tax bill?

$ 8,000

Page 90 — 32 points

Percent 2

32

Remember: to find the percent of something, change the percent to a decimal and then multiply.

Work out the following percent problems.

6 points:

1. 25% of 200 = .25 × 200 = 50
2. 78% of 423 = 329.94
3. 7% of 2,000 = 140
4. 18% of 25 = 4.5
5. 99% of 100 = 99
6. 50% of 94 = 47

100% is all of something. It is 1.00 or 1. or one whole. More than 100% is more than 1.00 or more than one whole. 135% is 1.35 or one whole and $\frac{35}{100}$

Write the following percents first as whole numbers and decimals and then as mixed numbers.

11 points:

7. 178% = 1.78 = $1\frac{78}{100} = 1\frac{39}{50}$
8. 112% = 1.12 = $1\frac{12}{100} = 1\frac{6}{50}$
9. 199% = 1.99 = $1\frac{99}{100}$
10. 225% = 2.25 = $2\frac{25}{100} = 2\frac{1}{4}$
11. 342% = 3.42 = $3\frac{42}{100} = 3\frac{21}{50}$
12. 500% = 5.00 = 5

Some percents like 37.5% or 66.7% are not exact hundredths. As you can see, these percents have decimal points in them. To change these percents to decimals, move the decimal point two places to the left. You may have to add a zero to do this.

Change the following percents to decimals.

Examples:

37.5% = .375 7.5% = .075

7 points:

13. 66.7% = .667
14. 62.5% = .625
15. 33.3% = .333
16. 3.1% = .031
17. 4.91% = .0491
18. 77.01% = .7701
19. 125.3% = 1.253

Using what you have learned in the instructions above, carefully work out the following problems.

8 points:

20. 125% of 60 = 75
21. 150% of 212 = 318
22. 33.3% of 85 = 28.305
23. 29% of 63 = 18.27
24. 175% of 18 = 31.5
25. 215% of 69 = 148.35
26. 87.5% of 72 = 63
27. 4.5% of 900 = 40.5

Pages 91 and 92 — 40 points

Review 30

40

Write the following percents as fractions.

4 points:

1. 90% = $\frac{9}{10}$
2. 25% = $\frac{1}{4}$
3. 80% = $\frac{4}{5}$
4. $66\frac{2}{3}\%$ = $\frac{2}{3}$

Write the following fractions as percents.

7 points:

5. $\frac{1}{2}$ = 50 %
6. $\frac{1}{3}$ = $33\frac{1}{3}$ %
7. $\frac{1}{4}$ = 25 %
8. $\frac{1}{8}$ = $12\frac{1}{2}$ %
9. $\frac{5}{8}$ = $62\frac{1}{2}$ %
10. $\frac{1}{5}$ = 20 %
11. $\frac{9}{9}$ = 100 %

1 point:

12. $\frac{1}{3}$ of 18 = 6

Reduce the following fractions to lowest terms.

3 points:

13. $\frac{9}{45} = \frac{1}{5}$
14. $\frac{4}{6} = \frac{2}{3}$
15. $\frac{7}{8} \div \frac{1}{2} = 1\frac{3}{4}$

1 point:

16. Use a ruler to measure the line.

_____ = $1\frac{3}{4}$

2 points:

17. $7\frac{2}{3} + 4\frac{1}{3} = 12$
18. $8\frac{1}{5} - 1\frac{2}{5} = 6\frac{4}{5}$

1 point:

19. Write $6\frac{2}{5}$ as an improper fraction.

$\frac{32}{5}$

2 points:

20. $\frac{1}{5} + \frac{2}{3} = \frac{13}{15}$
21. $\frac{6}{7} + \frac{4}{7} = \frac{10}{7} = 1\frac{3}{7}$

2 points:

22. 7^3 = 343
23. Nine cubed = 729

2 points:

24. 95.004 ÷ 6.3 = 15.08
25. 2.08 × .78 = 1.6224

1 point:

26. Write 2,478 in Roman numerals.

MMCDLXXVIII

2 points:

27. Round off .98473718 to the nearest hundredth.

.98

28. Round off 18 to the nearest ten.

20

2 points:

29. 4.831 + 1.2 + 47 = 53.031
30. 9 − 2.87 = 6.13

2 points:

31. Write fourteen and eight thousandths in decimals.

14.008

32. Write 318,000,000 in words.

three hundred eighteen million

5 points:

33. How many feet are in a mile? 5,280
34. How many days are in a year? 365
35. How many pounds are in a ton? 2,000
36. How many quarts are in a gallon? 4
37. How many seconds are in five minutes? 300

3 points:

38. Charlie wants to save a thousand dollars. He can save $5 a week. How many weeks will it take him to reach his goal?

200 weeks

39. About how many years is that, if there are 52 weeks in a year?

about 4 years
(3 years and 44 weeks)

40. Mr. Gleason weighs 573 pounds. In March he loses 15.8 pounds; in April he loses 19.6 pounds; and in May he loses 14.5 pounds. Then in June he gains back 2.4 pounds. What does he weigh at the end of June?

525.5 pounds

Page 93 — 18 points

Percent 3

18

Change the following percents to decimals.

9 points:

1. 55% = .55
2. 67% = .67
3. 9% = .09
4. 73.1% = .731
5. 2% = .02
6. 125% = 1.25
7. 64% = .64
8. 7.3% = .073
9. 294% = 2.94

Now work out the following word problems. Remember: change the percent to a decimal and multiply.

5 points:

10. 60% of the children in a class of 25 are girls. How many girls are there?

15

11. A man puts $600 in a bank. The bank pays him 5% interest on that money each year. How much interest does the man make in one year?

$30

12. A boy took a test with 25 questions and got 80% right. How many did he get right?

20

13. 200,000 people voted in an election. The winning candidate got 55% of the votes. How many votes did she get?

110,000

14. A school has 900 students. It is 35% black. How many black students are there?

315

Percent **also means "out of a hundred." Subtract the percent from one hundred percent to answer the following questions.**

4 points:

15. 25% of a tank of gasoline is used up. What percent is left?

75 %

16. 99% of the people in a city are television owners. What percent is not?

1 %

17. 6% of the cars in a parking lot are foreign cars. What percent are not foreign?

94 %

18. 54% of the children in a class are girls. What percent of the students are boys?

46 %

Page 94 —— 16 points

Percent 4

16

Carefully work out the following problems. If an answer calls for a decimal point, don't forget to put it in.

16 points:

1. 65% of the people in a town of 24,000 are poor. How many people are poor?

   15,600

   How many are not poor? 8,400

2. 4% of a man's corn crop was destroyed by heavy rains. If the total crop was 8,900 bushels, how much was destroyed?

   356 bushels

   How much was not destroyed? 8,544 bushels

3. A woman puts $7,800 in a bank and will get 5.3% interest a year. How much interest will she get each year?

   $ 413.40

4. A school has 900 students. It is 55% white, 35% black, and 10% Chinese.

   How many white students are there?

   495

   How many black students are there?

   315

   How many Chinese students are there?

   90

5. A spelling test had 50 questions. If a girl got 98% right, how many questions did she get right?

   49

   How many were wrong? 1

6. In a state with 450,000 people, three candidates were running for governor. Figure out how many votes each one got.

   Harry Voteforme, 36% of the vote.

   162,000

   Ann Lawandorder, 22% of the vote.

   99,000

   Joe Prosperity, 42% of the vote.

   189,000

7. A tank of gasoline is 76% used up. What percent is not used up?

   24 %

8. A school is 49% boys. What percent is girls?

   51 %

9. There were three candidates for office. One got 41% of the votes, the second 23%. What percent of the votes did the third candidate get?

   36 %

Page 95 — 10 points

Test 30 — Percent

10

Change the following percents to decimals.

3 points:

1. 68% = .68
2. 4% = .04
3. 137% = 1.37

Work out the next three problems.

3 points:

4. What is 15% of 400?

   60

5. What is 125% of 64?

   80

6. What is 90% of 500?

   450

Now try these word problems.

4 points:

7. A woman has $4,300 in a bank. How much interest will she get in one year if the bank pays 6% interest?

   $ 258

8. There were 50 questions on a spelling test. A boy got 96% right. How many questions did he get right?

   48

9. 7% of the students in a school failed a test. What percent passed?

   93%

10. A class has 30 students. 40% of them are boys. How many girls are there? Be careful. First figure out how many boys there are.

    18

Page 96 — 26 points

Review Test 30

26

26 points:

1. Figure out what *A* is on the following number line.

A = 16

2. Write 308,000,000,000 in words.

three hundred eight billion

3. Factor 70 three ways. 7 x 10

5 x 14 2 x 35

4. 42465 ÷ 8 = 5308 1/8

5. Find the average of 9, 14, 25, and 32.

20

6. Write seventeen and four thousandths in decimals.

17.004

7. 69 + 2.637 + 2.18 = 73.817

8. 2.7 − 1.342 = 1.358

9. Round off 28,723 to the nearest thousand.

29,000

10. Round off .4265943 to the nearest hundredth.

.43

11. .273 × 69 = 18.837

12. Write MMCDLXXIII in Arabic numbers.

2473

13. 198.36 ÷ 2.9 = 68.4

14. 5^4 = 625

15. What fraction of the circle is shaded in?

6/8 or 3/4

16. If 9/13 of a test is right, what fraction is wrong? 4/13

17. Complete the ratio.

6 : 48 = 7 : 56

18. 2/7 ÷ 2/3 = 20/21

19. Reduce the following fractions to lowest terms.

9/8 = 1 1/8 12/16 = 3/4

20. Change $9\frac{3}{7}$ to an improper fraction. 66/7

21. $5\frac{2}{5} + 7\frac{4}{5} = 13\frac{1}{5}$

22. $9\frac{1}{7} - 4\frac{3}{7} = 4\frac{5}{7}$

23. Write point *B* as a mixed number. Reduce your answer to lowest terms.

B = 4 5/8

24. $1\frac{9}{10}$ of 2/3 = 1 4/15

25. 2/5 ÷ 7/10 = 4/7

26. 1/3 as a percent = 33 1/3 %

75% as a fraction = 3/4

Page 97 — 18 points

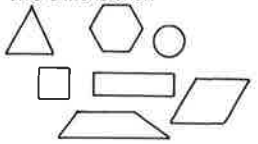
Unit 31 — Shapes and Dimensions 1

18

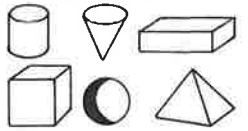
There are three *dimensions*.

Lines have one dimension. They are called *one-dimensional*.

Flat shapes have two dimensions. They are called *two-dimensional*.



Solid objects have three dimensions. They are called *three-dimensional*.



Next to each shape, write how many dimensions it has. Try to remember the names of the shapes — they are all important. Under the name of each shape, make your own small drawing of it.

18 points:

1. Triangle 2
2. Cube 3
3. Cone 3
4. Rectangle 2
5. Square 2
6. Pyramid 3
7. Circle 2
8. Box 3
9. Cylinder 3
10. Sphere 3
11. Line 1
12. Parallelogram 2
13. Rhombus 2
14. Ellipse 2
15. Trapezoid 2
16. Hexagon 2
17. Pentagon 2
18. Line 1

Page 98 —— 23 points

Shapes and Dimensions 2

23

After each shape, give examples of that shape in the world around you. Think of as many objects as you can for each shape.

23 points:

Teacher corrected: answers will vary

Two-dimensional Shapes

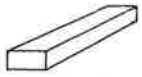
1. Triangle _____
2. Rectangle _____
3. Square _____
4. Circle _____
5. Parallelogram _____
6. Rhombus _____
7. Ellipse _____
8. Trapezoid _____
9. Pentagon _____
10. Hexagon _____

Three-dimensional Shapes

11. Pyramid _____
12. Box _____
13. Cube _____
14. Sphere _____
15. Cone _____
16. Cylinder _____

Give the names of the following shapes.

7 points:

17.  rectangle
18.  square
19.  cylinder
20.  cone
21.  parallelogram
22.  box
23.  trapezoid

Pages 99 and 100 —— 45 points

Review 31

45

3 points:

1. 50% of 72 = 36
2. 15% of 60 = 9
3. 92% of 980 = 901.6

3 points:

4. 7.5% as a decimal = .075
5. 92% as a decimal = .92
6. 120% as a decimal = 1.20

2 points:

7. If 48% is right, what percent is wrong?

52%

8. If 99% is finished, what percent is unfinished?

1%

Write the percent equivalent for each fraction below.

7 points:

9. $\frac{1}{3}$ = $33\frac{1}{3}$ %
10. $\frac{2}{3}$ = $66\frac{2}{3}$ %
11. $\frac{1}{2}$ = 50%
12. $\frac{3}{4}$ = 75 %
13. $\frac{1}{4}$ = 25 %
14. $\frac{2}{5}$ = 40 %
15. $\frac{9}{10}$ = 90 %

Write the fraction equivalent for each percent below.

4 points:

16. 99% = $\frac{99}{100}$
17. 60% = $\frac{3}{5}$
18. 10% = $\frac{1}{10}$
19. $12\frac{1}{2}$% = $\frac{1}{8}$

1 point:

20. Use a ruler to measure this line.

_____ = $1\frac{1}{16}$

Reduce the following.

2 points: $\frac{1}{8}$

21. $\frac{6}{48}$ = _____ 22. $\frac{14}{16}$ = $\frac{7}{8}$

2 points:

23. Write 14.09 in words.

fourteen and nine hundredths

24. Write twelve million in numbers.

12,000,000

1 point:

25. Write $9\frac{1}{7}$ as an improper fraction.

$\frac{64}{7}$

3 points:

26. $\frac{8}{15} \div \frac{4}{5}$ = $\frac{8}{15} \times \frac{5}{4} = \frac{2}{3}$
27. $\frac{4}{7} \times \frac{14}{15}$ = $\frac{4}{7} \times \frac{14}{15} = \frac{8}{15}$
28. $\frac{8}{9} + \frac{8}{9}$ = $\frac{16}{9} = 1\frac{7}{9}$

2 points:

29. $7\frac{1}{11} - 4\frac{3}{11} = 2\frac{9}{11}$
30. $5\frac{2}{3} + 4\frac{2}{3} = 9\frac{4}{3} = 10\frac{1}{3}$

2 points:

31. $\frac{9}{10} - \frac{1}{4}$ = $\frac{13}{20}$
32. $\frac{3}{4} + \frac{1}{7}$ = $\frac{21}{28} + \frac{4}{28} = \frac{25}{28}$

1 point:

33. Four cubed = 64

1 point:

34. 324.544 ÷ .64 = 507.1

1 point:

35. Use Roman numerals to write 1,466.

MCDLXVI

1 point:

36. 97.1 × 65 = 6311.5

1 point:

37. Round off 16.9342179 to the nearest thousandth.

16.934

1 point:

38. 69 − 14.691 = 54.309

3 points:

39. A new color TV usually costs $418, but it is being sold at a 15% discount. How much is the discount?

$ 62.70

40. How much does the TV cost now? $355.30

41. Manuel's piggy bank had 47 quarters, 211 dimes, 41 nickels, and 150 pennies in it. How much is all that in dollars and cents?

$ 36.40

4 points:

42. How many days are in March? 31

43. How many days are in November? 30

44. How many days are in January? 31

45. How many quarts are in 5 gallons? 20

Page 101 — 46 points

Shapes and Dimensions 3

46

Give the names of the following shapes. Inside the shape, write the number of dimensions it has.

Example:

30 points:

Triangle

1. 

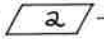
rectangle

2. 

square

3. 

circle

4. 

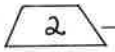
parallelogram

5. 

rhombus

6 

ellipse

7 

trapezoid

8. 

pentagon

9. 

hexagon

10. 

pyramid

11. 

box

12. 

cube

13. 

sphere

14. 

cone

15. 

cylinder

Next to the name of each shape, draw a picture of it. Be neat!

16 points:

16. Pyramid 

17. Box 

18. Rhombus 

19. Square 

20. Pentagon (five sides) 

21. Ellipse 

22. Sphere 

23. Triangle 

24. Cube 

25. Parallelogram 

26. Cylinder 

27. Rectangle 

28. Circle 

29. Trapezoid 

30. Cone 

31. Hexagon (six sides) 

Page 102 — 36 points

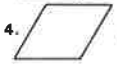
Shapes and Dimensions 4

36

Next to each shape below, write its name and the number of dimensions it has.
Choose your answers from this list:

triangle	parallelogram	pentagon	cube
rectangle	rhombus	hexagon	sphere
square	ellipse	pyramid	cone
circle	trapezoid	box	cylinder

32 points:

1.		pyramid	3	9.		ellipse	2
2.		hexagon	2	10.		cylinder	3
3.		box	3	11.		parallelogram	2
4.		rhombus	2	12.		circle	2
5.		cone	3	13.		sphere	3
6.		trapezoid	2	14.		rectangle	2
7.		square	2	15.		cube	3
8.		pentagon	2	16.		triangle	2

4 points:

17. What is the shape of a basketball?
sphere

18. What is the shape of a can of Coke?
cylinder

19. What is the shape of a brick?
box

20. What is the shape of a party hat?
cone

Page 103 — 20 points

Test 31 — Shapes and Dimensions

20

Next to each shape, write the number of dimensions it has.

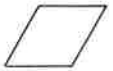
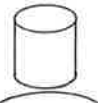
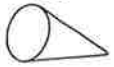
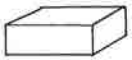
4 points:

1.  2
2.  1
3.  3
4.  2

Name the following shapes. Choose your answers from the list below.

cylinder	box	trapezoid	triangle
cone	pyramid	ellipse	rhombus
sphere	hexagon	rectangle	parallelogram
cube	pentagon	circle	square

16 points:

5.		rectangle		13.		hexagon	
6.		pyramid		14.		cube	
7.		rhombus		15.		sphere	
8.		cylinder		16.		cone	
9.		ellipse		17.		parallelogram	
10.		pentagon		18.		box	
11.		trapezoid		19.		triangle	
12.		circle		20.		square	

Pages 104 and 105 — 28 points

Review Test 31

28

28 points:

1. Figure out what *A* is on the following number line.

A = 35

2. Write forty-seven million in numbers.

47,000,000

3. Factor 48 four ways. 4 x 12 2 x 24 3 x 16 6 x 8

4. 45335 ÷ 9 = 5037 2/9

5. Find the average of 36, 29, and 43.

36

6. Write 7.13 in words.

seven and thirteen hundredths

7. 293.774 + 3.6 + 18 = 315.374

8. 29.4 − 1.217 = 28.183

9. Round off 271,435,628 to the nearest million.

271,000,000

10. Round off .477921836 to the nearest thousandth.

.478

11. 7.93 × .64 = 5.0752

12. Write 2,739 in Roman numerals.

MMDCCXXXIX

13. 23.154 ÷ .34 = 68.1

14. Five cubed = 125

15. What fraction of the circle is shaded in?

2/8 or 1/4

16. If $\frac{7}{11}$ of a race is finished, what fraction is left to go? $\frac{4}{11}$

17. Complete the ratio.

9 : 27 = 11 : 33

18. $\frac{4}{5} - \frac{3}{8} = \frac{32}{40} - \frac{15}{40} = \frac{17}{40}$

19. Reduce the following fractions to lowest terms.

$\frac{9}{45} = \frac{1}{5}$ $\frac{4}{22} = \frac{2}{11}$

20. Change $4\frac{7}{8}$ to an improper fraction. $\frac{39}{8}$

21. $9\frac{4}{9} + 6\frac{7}{9} = 15\frac{11}{9} = 16\frac{2}{9}$

22. $7\frac{1}{5} - 2\frac{4}{5} = 4\frac{2}{5}$

23. Write point *B* as a mixed number. Reduce the answer to lowest terms.

B = $2\frac{3}{8}$

24. $\frac{4}{9}$ of 27 = 12

25. $\frac{4}{7} + \frac{20}{21}$ $\frac{4}{7} \times \frac{21}{20} = \frac{3}{5}$

26. $\frac{1}{5}$ as a percent = 20%

$66\frac{2}{3}$% as a fraction = $\frac{2}{3}$

27. 95% of 200 = 190

28. If 47% of a test is wrong, what percent is right?

53 %

Page 106 — 13 points

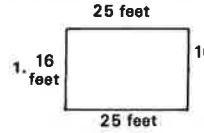
Unit 32 — Perimeter 1

13

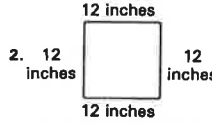
13 points:

The *perimeter* is the distance all the way around the outside of something. To find the perimeter of any shape, add up the lengths of its sides.

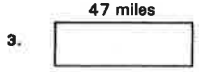
Find the perimeters of the following shapes. Mark your answers in feet, inches, or miles.

1. 

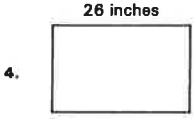
82 feet

2. 

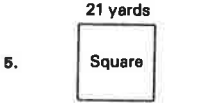
48 inches

3. 

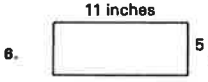
112 miles

4. 

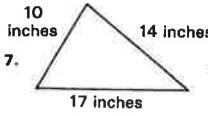
92 inches

5. 

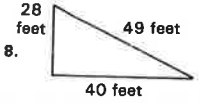
84 yards

6. 

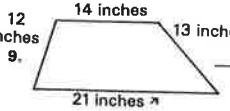
32 inches

7. 

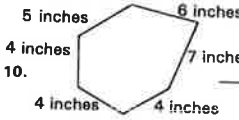
41 inches

8. 

117 feet

9. 

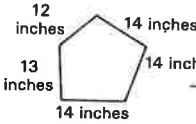
60 inches

10. 

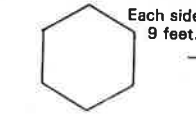
30 inches

11. 

700 miles

12. 

67 inches

13. 

54 feet

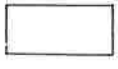
Page 107 — 13 points

Perimeter 2

13

13 points:

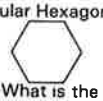
Remember: the perimeter is the distance all the way around the outside of something.
Find the perimeters of the following shapes. Be sure to mark your answers in inches, feet, miles, or yards.

Rectangle 

1. What is the perimeter of a rectangle 15 feet long and 10 feet wide?
50 feet
2. What is the perimeter of a rectangle 24 inches long and 11 inches wide?
70 inches
3. What is the perimeter of a rectangle 200 miles long and 150 miles wide?
700 miles
4. What is the perimeter of a field 50 yards long and 29 yards wide?
158 yards
5. What is the perimeter of a house 39 feet long and 28 feet wide?
134 feet
6. What is the perimeter of a room 30 feet long and 22 feet wide?
104 feet
7. What is the perimeter of a rug 12 feet long and 9 feet wide?
42 feet

Square 

8. What is the perimeter of a square whose sides are each 9 inches long?
36 inches
9. What is the perimeter of a square whose sides are each 95 yards long?
380 yards
10. What is the perimeter of a square whose sides are each 47 miles long?
188 miles

Regular Hexagon 
All sides are equal.

11. What is the perimeter of a hexagon whose sides are each 6 inches long?
36 inches
12. What is the perimeter of a hexagon whose sides are each 49 feet long?
294 feet
13. What is the perimeter of a hexagon whose sides are each 427 yards long?
2562 yards

Pages 108 and 109 —— 46 points

Review 32

46

After each shape, write its name. Then write the number of dimensions it has.

12 points:

1. square 2. 2

3. triangle 4. 2

5. hexagon 6. 2

7. sphere 8. 3

9. circle 10. 2

11. line 12. 1

4 points:

13. If 63% of the class is boys, what percent is girls?

37 %

14. 18% of 650 = 117

15. 80% as a fraction = $\frac{4}{5}$

16. 25% as a fraction = $\frac{1}{4}$

3 points:

17. $\frac{11}{12} + \frac{5}{6} =$ $1\frac{1}{10}$

18. $\frac{1}{2}$ of 18 = 9

19. $\frac{9}{10} \times \frac{6}{7} =$ $\frac{27}{35}$

1 point:

20. Use a ruler to measure the line.

_____ = $2\frac{1}{4}$

Reduce the following fractions to lowest terms.

2 points:

21. $\frac{8}{20} = \frac{2}{5}$ 22. $\frac{9}{15} = \frac{3}{5}$

1 point:

23. Write $2\frac{1}{9}$ as an improper fraction.

$\frac{19}{9}$

2 points:

24. $8\frac{3}{4} + 2\frac{1}{4} = 11$

25. $9\frac{1}{7} - 2\frac{6}{7} = 6\frac{2}{7}$

2 points:

26. $\frac{2}{3} + \frac{1}{6} = \frac{5}{6}$

27. $\frac{3}{4} - \frac{1}{7} = \frac{17}{28}$

1 point:

28. $7^2 + 9^2 =$ 130

1 point:

29. 111.54 ÷ .26 = 429

30. Write MMCDXLIV as an Arabic number.

2444

2 points:

31. Round off 73.911113 to the nearest one.

74.

32. Round off 56,277 to the nearest thousand.

56,000

3 points:

33. Ms. Rumple drove her car 93,005 miles before it fell to pieces. She said that over the years the car went 19 miles for every gallon of gas. How much gas did the car use in its lifetime?

4895 gallons of gas

34. If gas cost an average of $ .81 over the years, how much did Ms. Rumple spend on gas?

$ 3964.95

35. Helene got $5.00 and gave half of it to her brother. She spent half of what she had left on candy. How much money did she have then?

$ 1.25

3 points:

36. Circle the metric measure you would use to measure the thickness of a nickel.

(millimeter)
centimeter
meter
kilometer

37. Which metric measure would you use to measure the length of a cigarette?

centimeters

38. Which metric measure would you use to measure the distance to the moon?

kilometers

8 points:

39. How many quarts are in a gallon? 4

40. How many days are in a week? 7

41. How many days are in a leap year? 366

42. How many days are in February in a leap year?

29

43. How many years are in a century? 100

44. How many pounds are in 2 tons? 4,000

45. How many feet are in 2 miles? 10,560

46. How many inches are in 5 feet? 60

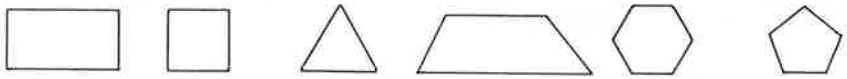
Page 110 —— 9 points

Perimeter 3

9

Below, there are six shapes which you will be using in the problems on this page. Remember which shape is which!

Rectangle Square Triangle Trapezoid Hexagon Pentagon



Answer the following questions.

9 points:

1. What is the perimeter of a rectangle 16 feet long and 11 feet wide?
   54 feet
2. What is the perimeter of a triangle with sides of 5 inches, 3 inches, and 9 inches?
   17 inches
3. What is the perimeter of a square with sides of 52 inches?
   208 inches
4. Each side of a pentagon measures 24 feet. What is the perimeter of the pentagon?
   120 feet
5. What is the perimeter of a triangle with sides of 93 miles, 28 miles, and 22 miles?
   143 miles
6. What is the perimeter of a rectangle 327 yards long and 216 yards wide?
   1086 yards
7. Each side of a hexagon measures 71 feet. What is the perimeter of the hexagon?
   426 feet
8. What is the perimeter of a rectangle 91 miles long and 2 miles wide?
   186 miles
9. What is the perimeter of a trapezoid with sides of 8 feet, 9 feet, 11 feet, and 10 feet?
   38 feet

Page 111 —— 10 points

Perimeter 4

10

Work out the following problems. Make a small drawing of each shape if it will help you.

10 points:

1. What is the perimeter of a rectangle 19 feet long and 16 feet wide?
   70 feet
2. What is the perimeter of a triangle whose sides are 12 inches, 10 inches, and 8 inches?
   30 inches
3. What is the perimeter of a hexagon whose sides are all 15 yards long?
   90 yards
4. What is the perimeter of a rectangle 325 yards long and 210 yards wide?
   1070 yards
5. What is the perimeter of a pentagon whose sides are all 32 inches long?
   160 inches
6. What is the perimeter of a trapezoid whose sides are 28 feet, 35 feet, 28 feet, and 19 feet?
   110 feet
7. What is the perimeter of a rectangle 200 miles long and 15 miles wide?
   430 miles
8. What is the perimeter of a triangle with sides of 191 yards, 100 yards, and 85 yards?
   376 yards
9. What is the perimeter of a rectangle 85 miles long and 34 miles wide?
   238 miles
10. What is the perimeter of a square with sides 84 yards long?
    336 yards

Page 112 — 10 points

Test 32 — Perimeter

10

Work out the following problems.

10 points:

1. What is the perimeter of a rectangle 35 feet long and 19 feet wide?

   108 feet

2. What is the perimeter of a square whose sides are all 15 yards long?

   60 yards

3. What is the perimeter of a triangle with sides of 43 yards, 23 yards, and 18 yards?

   84 yards

4. What is the perimeter of a hexagon whose sides are all 4 miles long?

   24 miles

5. What is the perimeter of a pentagon whose sides are all 300 yards long?

   1,500 yards

6. What is the perimeter of a rectangle 341 miles long and 112 miles wide?

   906 miles

7. What is the perimeter of a trapezoid with sides of 32 inches, 21 inches, 14 inches, and 9 inches?

   76 inches

8. What is the perimeter of a square with sides of 98 yards?

   392 yards

9. What is the perimeter of a triangle with sides of 54 yards, 32 yards, and 29 yards?

   115 yards

10. What is the perimeter of a rectangle 465 miles long and 19 miles wide?

    968 miles

Pages 113 and 114 — 28 points

Review Test 32

28

28 points:

1. Figure out what *A* is on the following number line.

   A = 30

2. Write 907,000,000,000,000 in words.

   nine hundred seven trillion

3. Factor 56 three ways. 7 x 8, 4 x 14, 2 x 28

4. 26243 ÷ 8 = 3280 $\frac{3}{8}$

5. Find the average of 198 and 134.

   166

6. Write sixteen and eleven thousandths in decimals.

   16.011

7. 180 + 2.73 + 11.9 = 194.63

8. 61.97 − 4.385 = 57.585

9. Round off 257,991 to the nearest thousand.

   258,000

10. Round off 78.273499 to the nearest one.

    78

11. 234 × .73 = 170.82

12. Write MMDCCXLVII as an Arabic number.

    2747

13. 624.96 ÷ 9.3 = 67.2

14. 4^4 = 256

15. What fraction of the circle is shaded in?

    $\frac{3}{6}$ or $\frac{1}{2}$

16. If $\frac{2}{15}$ of a job is done, what fraction remains to be done? $\frac{13}{15}$

17. Complete the ratio.

    7 : 49 = 10 : 70

18. $\frac{4}{5} + \frac{1}{8} = \frac{37}{40}$

19. Reduce the following fractions to lowest terms.

    $\frac{7}{42} = \frac{1}{6}$ $\frac{15}{25} = \frac{3}{5}$

20. Change $8\frac{1}{6}$ to an improper fraction.

    $\frac{49}{6}$

21. $7\frac{4}{7} + 8\frac{5}{7} = 16\frac{2}{7}$

22. $9\frac{1}{3} - 4\frac{2}{3} = 4\frac{2}{3}$

23. Write point *B* as a mixed number. Reduce your answer to lowest terms.

    B = $7\frac{1}{2}$

24. $\frac{7}{8}$ of 40 = 35

25. $\frac{9}{10} + \frac{11}{15} = 1\frac{5}{22}$

26. $\frac{1}{3}$ as a percent = $33\frac{1}{3}$ %

    50% as a fraction = $\frac{1}{2}$

27. 82% of 450 = 369

28. If 51% of a school is boys, what percent is girls?

49 %

Page 115 — 12 points

Unit 33 — Area and Volume 1

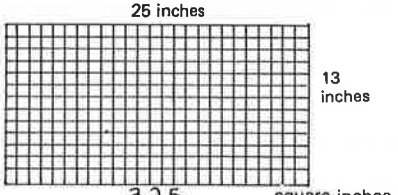
12

To find the *area* of a rectangle, multiply the length by the width (how long times how wide). The area is how many *square units* there are on a flat surface, so you give the answer in square inches, square feet, square yards, or square miles.

Use the rule stated above to find the answers to the following problems.

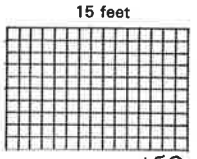
12 points:

1. Find the area of this box. Use the rule you just learned to figure out the answer. Don't count all the square inches!



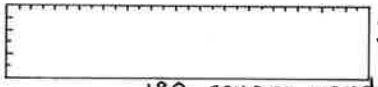
325 square inches

2. What is the area of this box?



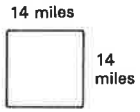
150 square feet

3. What is the area of this box?



180 square yards

4. What is the area of this box?



196 square miles

5. What is the area of a room 9 feet long and 8 feet wide?

72 square feet

6. What is the area of a field 100 yards long and 50 yards wide?

5000 square yards

7. What is the area of a tabletop 18 inches long and 11 inches wide?

198 square inches

8. What is the area of a rectangular state 43 miles long and 16 miles wide?

688 square miles

9. What is the area of a piece of paper 11 inches long and 8 inches wide?

88 square inches

10. What is the area of a playground 40 yards long and 25 yards wide?

1000 square yards

11. If you found the area of a piece of notebook paper, would your answer be in square feet, square inches, square yards, or square miles?

square inches

12. If you found the area of a basketball court, would your answer be in square inches, square yards, or square miles?

square yards

Page 116 —— 14 points

Area and Volume 2

14

Find the area in the following problems.
Remember: multiply the length by the width and give the answer in square inches, square feet, square yards, or square miles.

7 points:

1. What is the area of a rug 12 feet long and 9 feet wide?

   108 square feet

2. What is the area of a roof 15 yards long and 12 yards wide?

   180 square yards

3. What is the area of a field 160 yards long and 92 yards wide?

   14,720 square yards

4. What is the area of a piece of paper 18 inches long and 6 inches wide?

   108 square inches

5. What is the area of a gymnasium floor 82 yards long and 40 yards wide?

   3,280 square yards

6. What is the area of a room 22 feet long and 15 feet wide?

   330 square feet

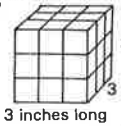
7. A man wants to put squares of carpet tile on the floor of a room. Each square of carpet tile is one square foot. How many tiles will he need if the room is 9 feet long and 8 feet wide?

   72 tiles

Find the *volume* in the following problems.
To find the *volume*, multiply the length by the width by the height (or depth).
The *volume* of a solid object or space is the number of *cubic units* in it, so give your answers in cubic inches, cubic feet, cubic yards, or cubic miles.

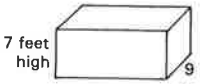
7 points:

8. How many cubic inches are there in this box?



   27 cubic inches

9. How many cubic feet are there in this box?



   1008 cubic feet

10. What is the volume of a box 4 yards long, 3 yards wide, and 2 yards high?

    24 cubic yards

11. What is the volume of a room 12 feet long, 9 feet wide, and 8 feet high?

    864 cubic feet

12. What is the volume of a stick of butter 4 inches long, 1 inch wide, and 1 inch high?

    4 cubic inches

13. If you found the area of a small bedroom, would your answer be in square inches, square feet, or square miles?

    square feet

14. If you found the volume of the planet earth, would you state your answer in cubic inches, cubic feet, cubic yards, or cubic miles?

    cubic miles

Pages 117 and 118 — 43 points

Review 33

43

3 points:

1. What is the perimeter of a square whose sides are 15 feet long?

   60 feet

2. What is the perimeter of a basketball court 20 yards long and 12 yards wide?

   64 yards

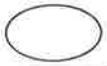
3. What is the perimeter of a garden 24 yards long and 13 yards wide?

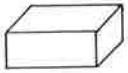
   74 yards

Name each shape below.

4 points:

4.  cylinder

5.  ellipse

6.  box

7.  pentagon

1 point:

8. If 29% of the group is men, what percent is women?

   71 %

1 point:

9. 65% of 240 = 156

1 point:

10. Use a ruler to measure the line.

    ____ = $2\frac{1}{8}$

2 points:

11. 20% as a fraction = $\frac{1}{5}$

12. $\frac{1}{3}$ as a percent = $33\frac{1}{3}\%$

4 points:

13. $\frac{4}{5} \div \frac{17}{20} =$ $\frac{16}{17}$

14. $\frac{9}{10} \times \frac{5}{6} = \frac{45}{60} = \frac{3}{4}$

15. $\frac{3}{4} - \frac{1}{7} = \frac{21}{28} - \frac{4}{28} = \frac{17}{28}$

16. $\frac{4}{5} + \frac{3}{4} = \frac{16}{20} + \frac{15}{20} = \frac{31}{20} = 1\frac{11}{20}$

Reduce the following fractions to lowest terms.

2 points:

17. $\frac{9}{27} = \frac{1}{3}$ 18. $\frac{18}{24} = \frac{3}{4}$

1 point:

19. Write $5\frac{3}{8}$ as an improper fraction.

    $\frac{43}{8}$

2 points:

20. $8\frac{1}{9} + 7\frac{8}{9} = 16$

21. $3\frac{1}{3} - 1\frac{2}{3} = 1\frac{2}{3}$

2 points:

22. $4^3 =$ 64

23. Two to the fifth = 32

1 point:

24. 390.83 ÷ 1.9 = 205.7

1 point:

25. 16.8 − 14.913 = 1.887

1 point:

26. Round off .9648371 to the nearest hundredth.

    .96

11 points:

27. How many days are in April? 30
28. How many days are in July? 31
29. How many days are in December? 31
30. How many days are in February? 28
31. How many feet are in a mile? 5,280
32. How many inches are in a foot? 12
33. How many feet are in a yard? 3
34. How many pints are in a quart? 2

35. How many cents are in a half-dollar?
50 ¢

36. How many nickels are in a dollar? 20

37. How many minutes are in an hour? 60

38. Circle the metric measure you would use to measure the height of a house.
millimeters
centimeters
(meters)
kilometers

39. Circle the metric measure you would use to measure the amount of water in a swimming pool.
milliliter
(liter)

40. A car weighs 3,980 pounds. $\frac{1}{5}$ of the weight of the car is the engine. How much does the engine weigh?
796 pounds

41. If 7 men divide up $3,000 so each gets the same amount, how much does each man get?
$ 428.57

How much is left over?
1 ¢

42. A man makes $118.35 in a week. How much does he make in 24 weeks?
$ 2840.40

Page 119 — 13 points

Area and Volume 3

13

Find the area in the following problems. Remember to give the answers in *square* units.

7 points:

1. What is the area of a room 16 feet long and 9 feet wide?
144 square feet

2. What is the area of a rug 9 feet long and 7 feet wide?
63 square feet

3. What is the area of a lawn 16 yards long and 12 yards wide?
192 square yards

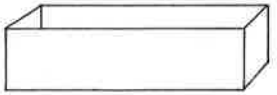
4. What is the area of a field 24 yards long and 17 yards wide?
408 square yards

5. What is the area of a piece of paper 6 inches long and 5 inches wide?
30 square inches

6. What is the area of a tabletop 18 inches long and 14 inches wide?
252 square inches

7. What is the area of a room 22 feet long and 19 feet wide?
418 square feet

Find the volume in the following problems. Remember to give the answers in *cubic* units.



6 points:

8. What is the volume of a shoe box 12 inches long, 5 inches wide, and 4 inches deep?
240 cubic inches

9. What is the volume of a grave 6 feet long, 3 feet wide, and 6 feet deep?
108 cubic feet

10. What is the volume of a room 10 feet long, 9 feet wide, and 8 feet high?
720 cubic feet

11. What is the volume of a prison cell 8 feet long, 8 feet wide, and 7 feet high?
448 cubic feet

12. What is the volume of a desk drawer 14 inches long, 13 inches wide, and 5 inches deep?
910 cubic inches

13. What is the volume of a box 8 feet long, 8 feet wide, and 8 feet high?
512 cubic feet

Page 120 — 9 points

Area and Volume 4

9

Find the area or volume in the following problems. Remember to give the answers in square units or in cubic units.

9 points:

1. What is the area of a piece of paper 17 inches long and 11 inches wide?

   187 square inches

2. What is the area of a floor 19 yards long and 16 yards wide?

   304 square yards

3. What is the volume of a box 14 inches long, 12 inches wide, and 4 inches deep?

   672 cubic inches

4. What is the volume of a hole in the ground 26 yards long, 21 yards wide, and 16 yards deep?

   8,736 cubic yards

5. What is the area of a field 180 feet long and 97 feet wide?

   17,460 square feet

6. What is the volume of a box 4 inches long, 4 inches wide, and 3 inches high?

   48 cubic inches

7. What is the volume of a room 10 yards long, 7 yards wide, and 4 yards high?

   280 cubic yards

8. What is the area of a tabletop 21 inches long and 14 inches wide?

   294 square inches

9. What is the area of a land area 47 miles long and 25 miles wide?

   1,175 square miles

Page 121 — 10 points

Test 33—Area and Volume

10

Work out the following problems.

10 points:

1. What is the area of a football field 100 yards long and 50 yards wide?

   5000 square yards

2. What is the volume of a box 4 feet long, 3 feet wide, and 7 feet deep?

   84 cubic feet

3. What is the volume of a room 10 feet long, 9 feet wide, and 7 feet high?

   630 cubic feet

4. What is the area of a piece of paper 8 inches long and 11 inches wide?

   88 square inches

5. What is the volume of a stick of butter 4 inches long, 4 inches wide, and 1 inch high?

   16 cubic inches

6. What is the area of a piece of land 15 miles long and 12 miles wide?

   180 square miles

7. What is the volume of a closet 5 feet long, 4 feet wide, and 9 feet high?

   180 cubic feet

8. What is the area of a room's floor that is 67 feet long and 40 feet wide?

   2,680 square feet

9. What is the volume of the inside of a barn that is 47 feet long, 38 feet wide, and 20 feet high?

   35,720 cubic feet

10. What is the area of a tabletop 35 inches long and 20 inches wide?

    700 square inches

Page 122 and 123 —— 29 points

Review Test 33

29

29 points:

1. Figure out what *A* is on the following number line.

A = 55

2. Write nine hundred seventy billion in numbers.

970,000,000,000

3. Factor 40 three ways. 4 x 10

2 x 20 5 x 8

4. 42260 ÷ 7 = $6037\frac{1}{7}$

5. Find the average of 99, 87, 22, and 32.

60

6. Write 3.05 in words.

three and five hundredths

7. 14.93 + 8.291 + 493 = 516.221

8. 68.4 − 2.97 = 65.43

9. Round off 888,888,888 to the nearest million.

889,000,000

10. Round off 29.347921 to the nearest tenth.

29.3

11. .459 × .38 = .17442

12. Write 3,955 in Roman numerals.

MMMCMLV

13. 259.54 ÷ .38 = 683

14. Eight cubed = 512

15. What fraction of the square is shaded in?

$\frac{10}{16}$ or $\frac{5}{8}$

16. If $\frac{14}{21}$ of a test is right, what fraction is wrong? $\frac{7}{21} = \frac{1}{3}$

17. Complete the ratio.

8 : 64 = 9 : 72

18. $\frac{7}{8} - \frac{2}{3} = \frac{5}{24}$

19. Reduce the following fractions to lowest terms.

$\frac{4}{26} = \frac{2}{13}$ $\frac{8}{12} = \frac{2}{3}$

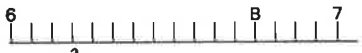
20. Change $7\frac{2}{3}$ to an improper fraction.

$\frac{23}{3}$

21. $4\frac{5}{11} + 3\frac{8}{11} = 8\frac{2}{11}$

22. $12\frac{1}{7} - 1\frac{5}{7} = 10\frac{3}{7}$

23. Write point *B* as a mixed number. Reduce your answer to lowest terms.



B = $6\frac{3}{4}$

24. $2\frac{4}{7} \times \frac{7}{8} = 2\frac{1}{4}$

25. $\frac{5}{24} + \frac{7}{8} = \frac{5}{21}$

26. $\frac{4}{5}$ as a percent = 80%

$33\frac{1}{3}$% as a fraction = $\frac{1}{3}$

27. 92% of 150 = 138

28. If 24% of a test is wrong, what percent is right?

76 %

29. What is the perimeter of a rectangle 7 miles long and 6 miles wide?

26 miles

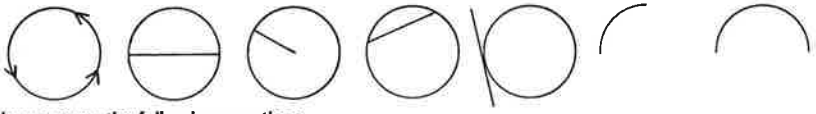
Page 124 — 11 points

Unit 34 — Circumference and Area of the Circle 1

11

Learn the names of the following terms used with circles.

Circumference Diameter Radius Chord Tangent Arc Semicircle



Now answer the following questions.

7 points:

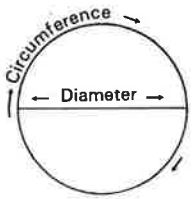
1. Which line touches only the outside of the circle? tangent
2. Which line goes from the center of the circle to the edge? radius
3. Which line touches the edge of the circle in two places but does not go through the center? chord
4. What do you call the distance around the circle? circumference
5. What do you call half a circle? semicircle
6. What do you call a small part of the circumference? arc
7. What do you call the line that cuts the circle in two? diameter

If you know the diameter of a circle, you can find the *circumference* by multiplying the diameter by 3.14. This is a special number called *pi*, discovered many years ago. It is from the Greek letter π. You should remember that $\pi = 3.14$.

Work out the following problems on circumference.

4 points:

8. What is the circumference of a circle whose diameter is 5 inches? 15.7 inches
9. What is the circumference of a circle whose diameter is 3 feet? 9.42 feet
10. What is the circumference of a circle whose diameter is 25 miles? 78.5 miles
11. What is the circumference of a circle whose diameter is 65 yards? 204.1 yards



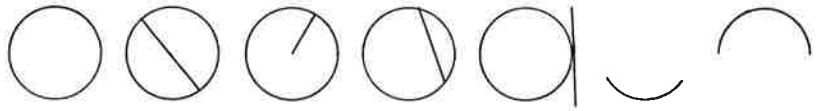
Page 125 — 11 points

Circumference and Area of the Circle 2

11

Remember the following terms used with circles.

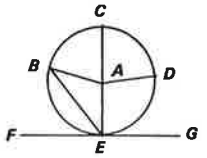
Circumference Diameter Radius Chord Tangent Arc Semicircle



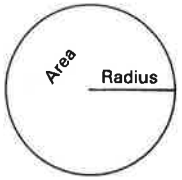
Using the diagram to the right, find the letters and write the terms which are used with the circle. For example, the term for *AC* on the diagram (the line between *A* and *C*) is *radius*.

8 points:

1. *AD* radius
2. *BE* chord
3. *FEG* tangent
4. *CAE* diameter
5. *AB* radius
6. *BC* arc
7. *BCDEB* circumference
8. *EDC* semicircle



To find the *area* of a circle, use this formula: Area = πr^2. This means you should multiply the radius by itself, and multiply the answer by *pi* (π) or 3.14. Give the answer in square units.



Work out the following problems. You've been given a little help with the first one.

3 points:

9. What is the area of a circle whose radius is 5 inches?

   Area = $\pi r^2 = 3.14 \times 5^2 = 3.14 \times 25 =$ 78.5 square inches

10. What is the area of a circle whose radius is 3 feet? 28.26 square feet
11. What is the area of a city whose radius is 8 miles? 200.96 square miles

Pages 126 and 127 — 49 points

Review 34

49

Label each of the following as inches, square inches, or cubic inches.

6 points:

1. Area of a table square inches
2. Volume of a shoebox cubic inches
3. Perimeter of a paper inches
4. Area of a paper square inches
5. Volume of an engine cubic inches
6. Perimeter of a table inches

1 point:

7. What is the perimeter of a room 27 feet long and 26 feet wide?

106 feet

1 point:

8. If 29% of a group is male, what percent is female?

71 %

1 point:

9. 89% of 2,400 2136

2 points:

10. $\frac{7}{10}$ as a percent = 70%

11. 75% as a fraction = $\frac{3}{4}$

3 points:

12. $\frac{7}{8} \times \frac{4}{5} = \frac{7}{10}$

13. $\frac{2}{3}$ of 39 = 26

14. $\frac{3}{4} + \frac{7}{8} = \frac{6}{7}$

1 point:

15. Use a ruler to measure the line.

_____ = $2\frac{1}{16}$

2 points:

Reduce the following fractions to lowest terms.

16. $\frac{9}{12} = \frac{3}{4}$

17. $\frac{15}{45} = \frac{1}{3}$

2 points:

18. $7\frac{3}{11} + 9\frac{9}{11} = 17\frac{1}{11}$

19. $9\frac{1}{7} - 1\frac{4}{7} = 7\frac{4}{7}$

1 point:

20. Round off 4.743992 to the nearest hundredth.

4.74

1 point:

21. Write $7\frac{3}{5}$ as an improper fraction.

$\frac{38}{5}$

1 point:

22. 2^5 = 32

3 points:

23. $\frac{3}{5} + \frac{4}{5} = 1\frac{2}{5}$

24. $\frac{7}{8} - \frac{2}{3} = \frac{5}{24}$

25. $\frac{5}{7} + \frac{1}{2} = 1\frac{3}{14}$

1 point:

26. 78.728 ÷ .26 = 302.8

1 point:

27. Write MCDLXIV as an Arabic number.

1,464

2 points:

28. 47.9 + 2.73 + 90 = 140.63

29. 14.8 − 7.219 = 7.581

How many dimensions does each of the following shapes have?

9 points:

30.  2

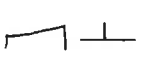
31.  3

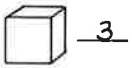
32.  2

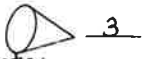
33.  2

34.  1

35.  3

36.  1

38.  3

37  3

4 points:

39. Circle the metric measure which is closest to a mile.

millimeter
centimeter
meter
(kilometer)

40. Circle the metric measure which is closest to a pound.

milligram
gram
(kilogram)

41. Which metric measure would you use to measure a football field?

meters

42. Which metric measure would you use to measure the milk on a milk truck?

liters

5 points:

43. How many years are in a century? 100
44. How many cups are in a pint? 2
45. How many inches are in a foot? 12
46. How many seconds are in a minute? 60
47. How many hours are in a day? 24

2 points:

48. Hamburger meat costs $1.95 a pound. How much would it cost a restaurant to buy a ton of hamburger meat?

$ 3,900

49. Mr. Spache has $1,218.43 in his savings account. He puts in $531 in May, $117.21 in June, and $219.11 in July. Then in August he takes out $900 to pay for a trip to Europe. How much is left in his account?

1185.75

Page 128 —— 24 points

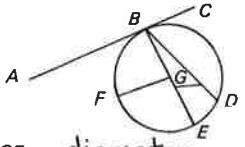
Circumference and Area of the Circle 3

24

Remember the following terms used with the circle.

Circumference	Distance around the circle
Diameter	Line cutting the circle in two
Radius	Line from the center to the edge
Tangent	Line touching only the outside of the circle
Arc	A small part of the circumference
Semicircle	Half a circle
Chord	Line touching the edge of the circle in two places but not going through the center

Using the diagram to the right, find the letters and write the terms which are used with the circle.



Example: GF = Radius

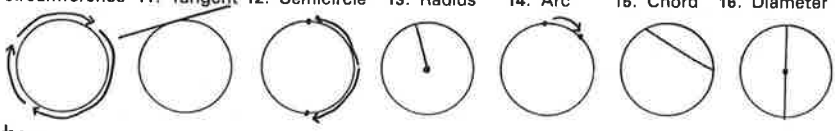
9 points:

1. BG radius
2. BD chord
3. $BDEFB$ circumference
4. ABC tangent
5. EG radius
6. BGE diameter
7. DE arc
8. BDE semi circle
9. BFE semicircle

On each circle below, make a drawing to show that you understand the term written above the circle.

7 points:

10. Circumference 11. Tangent 12. Semicircle 13. Radius 14. Arc 15. Chord 16. Diameter



8 points:

17. What is the number you multiply by the diameter to get the circumference?

    3.14 (pi or π)

    If you don't know this number, learn it!

18. What is the circumference of a circle whose diameter is 7 inches?

    21.98 inches

19. What is the circumference of a circle whose diameter is 9 miles?

    28.26 miles

20. What is the circumference of a circle whose diameter is 32 yards?

    100.48 yards

21. What is the area of a round swimming pool whose radius is 7 yards?

    153.86 square yards

22. What is the area of a frying pan whose radius is 5 inches?

    78.5 square inches

23. What is the area of a circle whose radius is 2 miles?

    12.56 square miles

24. What is the area of a circle whose radius is 1 foot?

    3.14 square feet

Page 129 —— 17 points

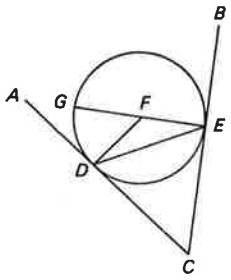
Circumference and Area of the Circle 4

17

On the line, write the term which goes with each group of letters. Use the letters in the drawing to figure out these terms used with the circle. Choose your answers from the list next to the drawing.

10 points:

1. EFG diameter
2. FD radius
3. BEC tangent
4. FG radius
5. DG arc
6. GDE semicircle
7. ADC tangent
8. DE chord
9. FE radius
10. $GDEG$ circumference



Circumference
Diameter
Radius
Chord
Tangent
Arc
Semicircle

Remember two important formulas:

Circumference = πd

Area = πr^2 (square units)

7 points:

Use these formulas to figure out the following problems.

11. What is the area of a circle whose radius is 5 feet?

    78.5 square feet

12. What is the circumference of a circle whose diameter is 32 inches?

    100.48 inches

13. What is the circumference of a baseball field whose diameter is 450 feet?

    1413 feet

14. What is the area of a circle whose radius is 4 miles?

    50.24 square miles

15. What is the area of a circle whose radius is 10 feet?

    314 square feet

16. What is the circumference of a circle whose diameter is 19 yards?

    59.66 yards

17. What is the area of a circle whose radius is 12 miles?

    452.16 square miles

Page 130 —— 15 points

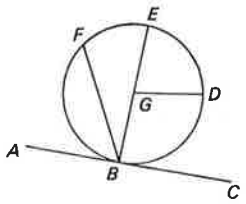
Test 34 — Circumference and Area of the Circle

15

On the line, write the term which goes with each group of letters. Use the letters in the drawing to figure out these terms used with the circle. Choose your answers from the list next to the drawing.

7 points:

1. *FE* arc
2. *GD* radius
3. *BF* chord
4. *ABC* tangent
5. *BGE* diameter
6. *BDEFB* circumference
7. *BDE* semicircle



Circumference
Diameter
Radius
Chord
Tangent
Arc
Semicircle

Work out the following problems.

8 points:

8. What is the circumference of a circle whose diameter is 3 inches?
   9.42 inches
9. What is the circumference of a circle whose diameter is 6 miles?
   18.84 miles
10. What is the circumference of a circle whose diameter is 8 yards?
    25.12 yards
11. What is the circumference of a circle whose radius is 2 inches?
    6.28 inches
12. What is the area of a circle whose radius is 4 miles?
    50.24 square miles
13. What is the area of a circle whose radius is 2 feet?
    12.56 square feet
14. What is the area of a circle whose radius is 9 yards?
    254.34 square yards
15. What is the area of a circle whose radius is 1 inch?
    3.14 square inches

Pages 131 and 132 — 31 points

Review Test 34

31

31 points:

1. Figure out what *A* is on the following number line.

   18 — A — 63

   A = 45
2. Write 900,000,000 in words.
   nine hundred million
3. Factor 30 three ways.
   5 x 6
   3 x 10
   2 x 15
4. 75065 ÷ 9 = 8340 5/9
5. Find the average of 36, 44, and 52.
   44
6. Write fifteen and three thousandths in decimals.
   15.003
7. 8 + 9.3 + 16.702 = 34.002
8. 68.59 − 2.473 = 66.117
9. Round off 278,522 to the nearest thousand.
   279,000
10. Round off .4283759 to the nearest hundredth.
    .43
11. 3.75 × 2.9 = 10.875
12. Write CMXLIV as an Arabic number.
    944
13. 435.84 ÷ 6.4 = 68.1
14. 9^2 = 81
15. What fraction of the circle is shaded in?
    4/12 or 1/3
16. If 11/47 of a group of teachers is men, what fraction is women?
    36/47
17. Complete the ratio.
    7 : 35 = 9 : 45
18. 3/4 + 1/7 = 25/28
19. Reduce the following fractions to lowest terms.
    7/63 = 1/9 32/40 = 4/5
20. Change $2\frac{9}{10}$ to an improper fraction.
    29/10
21. $9\frac{4}{5} + 8\frac{3}{5} = 18\frac{2}{5}$
22. $2\frac{1}{7} - 1\frac{4}{7} = \frac{4}{7}$
23. Write point *B* as a mixed number. Reduce your answer to lowest terms.

    3 — B — 4

    B = $3\frac{5}{8}$
24. 7/9 of 81 = 63
25. 9/10 ÷ 1 3/4 = 18/35
26. 1/2 as a percent = 50 %

    75% as a fraction = 3/4

27. 35% of 240 = 84

28. If 18% of a group is male, what percent is female?

82 %

29. What is the perimeter of a rectangle 14 miles long and 10 miles wide?

48 miles

30. What is the area of the rectangle in question 29?

140 square miles

31. What is the volume of a box 8 inches long, 4 inches wide, and 2 inches high?

64 cubic inches

Page 133 — 39 points

Unit 35 — Different Bases 1

39

Our number system is called *base ten* because there are ten different single numbers: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. The way we can count higher than 9 is by putting numbers in different places, as in the tens or the hundreds or the millions place.

But base ten isn't the only way to write numbers. We use it mainly because we have ten fingers. What if we had only eight fingers? Or seven? It is possible to write numbers in base eight or base seven or any other base.

Count the *X*s in each line below. Then figure out the number of *X*s in each base. The first one has been done for you.

39 points:

	Base Ten		Base Eight		Base Seven	
	groups of ten ↓	ones left over ↓	groups of eight ↓	ones left over ↓	groups of seven ↓	ones left over ↓
XXXXXXXXXXXX	1	2	1	4	1	5
1. XXXXXXXXXXXXXXXX	1	7	2	1	2	3
2. XXXXXXXXXX	1	0	1	2	1	3
3. XXXXXXXX		8	1	0	1	1
4. XXXXXXX		7		7	1	0
5. XXXXXXXXXXXXXXXXXXXX	2	1	2	5	3	0
6. XXXXXXXXXXXXXX	1	5	1	7	2	1
7. XXXXXXXXXXXXXXXXXXXXXXXX	2	5	3	1	3	4
8. XXXX		4		4		4
9. XXXXXXXXX		9	1	1	1	2
10. XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3	1	3	7	4	3
11. XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3	3	4	1	4	5
12. XXXXXXXXXXXX	1	2	1	4	1	5
13. XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3	6	4	4	5	1

Page 134 —— 42 points

Different Bases 2

42

For each line below, figure out the number of *X*s in each base. You will have to count the number of *X*s in each line.

	Base Ten groups of ten	Base Ten ones	Base Five groups of five	Base Five ones	Base Eight groups of eight	Base Eight ones
30 points: XXXXXXXXXXX	1	1	2	1	1	3
1. XXXXX		5	1	0		5
2. XXXXXXXXXXXXXX	1	5	3	0	1	7
3. XXXXXXXXXXXXXXXXXX	1	9	3	4	2	3
4. XXXXXXXXXXXXXXX	1	6	3	1	2	0
5. XXXXXXXXXXXXXXXXXXX	2	1	4	1	2	5
6. XXXXXXXXXXXXXXXXXXXXXX	2	4	4	4	3	0
7. XXXXXXXXXXXXXXXXXXXXXXXX	2	6	5	1	3	2
8. XXXXXXX		7	1	2		7
9. XXXXXXXXXXXXXXXXXXXXXXXXXXXX	3	1	6	1	3	7
10. XX		2		2		2

The numbers below are given in base six or base nine. Change them to base ten (our number system). Study the examples first.

	Base Six sixes	Base Six ones		Base Ten		Base Nine nines	Base Nine ones		Base Ten
	2	3	= (2×6)+3 =	15		2	3	= (2×9)+3 =	21
12 points: 11.	1	4	= (1×6)+4 =	10	17.	1	4	= 9+4 =	13
12.	3	5	= 18+5 =	23	18.	3	5	= 27+5 =	32
13.	2	1	= 12+1 =	13	19.	6	1	= 54+1 =	55
14.	1	1	= 6+1 =	7	20.	4	3	= 36+3 =	39
15.	5	5	= 30+5 =	35	21.	8	8	= 72+8 =	80
16.	2	4	= 12+4 =	16	22.	1	1	= 9+1 =	10

Pages 135 and 136 —— 45 points

Review 35

45

1 point:
1. 1207 × 427 = 515,389

5 points:
2. What is the area of a circle whose radius is 2 miles?
12.56 square miles
3. What is the area of a rectangle 17 feet long and 8 feet wide?
136 square feet
4. What is the circumference of a circle whose diameter is 9 yards?
28.26 yards
5. What is the volume of a box 3 inches long, 3 inches wide, and 2 inches high?
18 cubic inches
6. What is the perimeter of a hexagon whose sides are all 7 inches long?
42 inches

1 point:
7. If 77% of the rooms in a hotel are full, what percent are empty?
23 %

3 points:
8. 25% of 96 = 24
9. $\frac{2}{5}$ as a percent = 40 %
10. 80% written as a fraction = $\frac{4}{5}$

1 point:
11. 54.162 + .18 = 300.9

1 point:
12. Measure the line.
$= 1\frac{5}{16}$

3 points:
13. $\frac{7}{8}$ of 72 = 63
14. $\frac{2}{3} + \frac{7}{9} = \frac{2}{3} \times \frac{9}{7} = \frac{6}{7}$
15. $\frac{7}{11} \times \frac{4}{21} = \frac{4}{33}$

2 points:
16. $7\frac{4}{5} + 9\frac{1}{5} = 17$
17. $9\frac{1}{3} - 1\frac{2}{3} = 7\frac{2}{3}$

1 point:
18. Round off 69.51137 to the nearest one.
70.

1 point:
19. Write $2\frac{7}{8}$ as an improper fraction.
$\frac{23}{8}$

Reduce the following fractions to lowest terms.

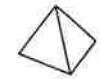
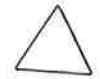
2 points:
20. $\frac{6}{36} = \frac{1}{6}$
21. $\frac{4}{50} = \frac{2}{25}$

1 point:
22. $10^2 + 5^3 =$ 225

1 point:
23. Write 1,551 in Roman numerals.
MDLI

2 points:
24. 147.9 + 8.3 + 1 = 157.2
25. 16 − .37 = 15.63

Identify the following shapes by name.

6 points:
26.  cube
27.  cone
28.  trapezoid
29.  pyramid
30.  triangle
31.  parallelogram

10 points:

32. How many days are in January? 31
33. How many days are in June? 30
34. How many days are in September? 30
35. How many days are in November? 30
36. How many feet are in a mile? 5,280
37. How many days are in a non-leap year? 365
38. How many ounces are in a pound? 16
39. How many quarts are in a gallon? 4
40. How many years are in a decade? 10
41. How many pounds are in a ton? 2,000

2 points:

42. Circle the metric measure which is closest to a mile.

meter
centimeter
(kilometer)
millimeter

43. Circle the metric measure which is closest to a quart.

milliliter
(liter)

2 points:

44. Mr. Small, a farmer, decided to walk all the way around the outside of a large field on his farm to check the fence for holes. If the field was 285 yards long and 116 yards wide, how far did he walk?

802 yards

45. How many feet is that? 2,406 feet

Page 137 —— 48 points

Different Bases 3

48

For each line below, figure out the number of *X*s in each base.

33 points:

	Base Ten		Base Nine		Base Eleven	
	tens	ones	nines	ones	elevens	ones
1. XXXXXXXXXXX	1	2	1	3	1	1
2. XXXXXXXXXXXXX	1	4	1	5	1	3
3. XXXXX		5		5		5
4. XXXXXXXXXXXXXXXXX	1	8	2	0	1	7
5. XXXXXXXXXXXXXX	1	5	1	6	1	4
6. XXX		3		3		3
7. XXXXXXXXXXXXXXXXXXXX	2	2	2	4	2	0
8. XXXXXXXXXXXXXXXXXXXXX	2	3	2	5	2	1
9. XXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3	1	3	4	2	9
10. XXXXXXXXXXXXXXXXXX	2	0	2	2	1	9
11. XXXXXXXXX		9	1	0		9

The numbers below are given in bases different from our number system. Change these numbers to base-ten numbers (our system).

15 points:

	Base Five (fives ones)	Base Ten		Base Seven (sevens ones)	Base Ten		Base Eleven (elevens ones)	Base Ten
12.	2 4 =	14	17.	1 6 =	13	22.	9 4 =	103
13.	3 1 =	16	18.	2 1 =	15	23.	6 1 =	67
14.	4 3 =	23	19.	3 5 =	26	24.	2 3 =	25
15.	1 0 =	5	20.	5 6 =	41	25.	2 0 =	22
16.	3 4 =	19	21.	3 0 =	21	26.	8 3 =	91

Page 138 — 33 points

Different Bases 4

33

Below are base-ten numbers. Write them as base-six, base-eight, and base-eleven numbers.

15 points:

	Base Ten (tens ones)	Base Six (sixes ones)	Base Eight (eights ones)	Base Eleven (elevens ones)
1.	15	23	17	14
2.	25	41	31	23
3.	6	10	6	6
4.	35	55	43	32
5.	22	34	26	20

The numbers below are written in different bases. Change them all to base-ten numbers.

18 points:

	Base Seven	Base Ten	Base Four	Base Ten	Base Five	Base Ten
6.	16 =	13	12. 31 =	13	18. 42 =	22
7.	24 =	18	13. 13 =	7	19. 14 =	9
8.	46 =	34	14. 22 =	10	20. 20 =	10
9.	20 =	14	15. 30 =	12	21. 44 =	24
10.	11 =	8	16. 11 =	5	22. 11 =	6
11.	33 =	24	17. 32 =	14	23. 33 =	18

Page 139 — 20 points

Test 35 — Different Bases

20

Below are base-ten numbers. Write them as base-seven, base-eight, and base-five numbers.

12 points:

	Base Ten	Base Seven	Base Eight	Base Five
1.	22	31	26	42
2.	16	22	20	31
3.	8	11	10	13
4.	11	14	13	21

The numbers below are written in different bases. Change them all to base-ten numbers.

8 points:

Base Six	Base Ten	Base Three	Base Ten	Base Eleven	Base Ten
5. 54 =	34	8. 12 =	5	11. 71 =	78
6. 12 =	8	9. 22 =	8	12. 98 =	107
7. 33 =	21	10. 10 =	3		

Pages 140 and 141 —— 33 points

Review Test 35

33

33 points:

1. Figure out what *A* is on the following number line.

A = 50

2. Write nine hundred eight trillion in numbers.

908,000,000,000,000

3. Factor 24 three ways. 4 x 6

3 x 8 2 x 12

4. 42611 ÷ 7 = 6087 $\frac{2}{7}$

5. Find the average of 18, 23, and 40.

27

6. Write 17.012 in words.

seventeen and twelve thousandths

7. 144 + 8.38 + 22.105 = 174.485

8. 22.9 − 4.733 = 18.167

9. Round off 67,288,920 to the nearest million.

67,000,000

10. Round off 16.93758264 to the nearest thousandth.

16.938

11. .289 × 47 = 13.583

12. Write 2,847 in Roman numerals.

MMDCCCXLVII

13. 24.447 ÷ .29 = 84.3

14. Five cubed = 125

15. What fraction of the circle is shaded in?

$\frac{8}{12}$ or $\frac{2}{3}$

16. If $\frac{15}{19}$ of a house is painted, what fraction remains to be painted? $\frac{4}{19}$

17. Complete the ratio.

8 : 96 = 7 : 84

18. $\frac{2}{3} - \frac{3}{5} = \frac{10}{15} - \frac{9}{15} = \frac{1}{15}$

19. Reduce the following fractions to lowest terms.

$\frac{6}{42} = \frac{1}{7}$ $\frac{18}{21} = \frac{6}{7}$

20. Change $9\frac{1}{2}$ to an improper fraction.

$\frac{19}{2}$

21. $5\frac{4}{5} + 4\frac{3}{5} = 10\frac{2}{5}$

22. $9\frac{1}{3} - 4\frac{2}{3} = 4\frac{2}{3}$

23. Write point *B* as a mixed number. Reduce your answer to lowest terms.

B = $7\frac{3}{8}$

24. $\frac{2}{3} \times 1\frac{9}{10} = 1\frac{4}{15}$

25. $\frac{4}{5} + \frac{8}{9} = \frac{9}{10}$

26. $\frac{3}{8}$ as a percent = $37\frac{1}{2}\%$

$66\frac{2}{3}\%$ as a fraction = $\frac{2}{3}$

27. 25% of 740 = 185

28. If 63% of a job is done, what percent remains to be done?

37 %

29. What is the perimeter of a rectangle 19 miles long and 7 miles wide?

52 miles

30. What is the area of a rectangle 5 inches long and 4 inches wide?

20 square inches

31. What is the volume of a box 14 feet long, 10 feet wide, and 6 feet high?

840 cubic feet

32. What is the circumference of a circle whose diameter is 7 feet?

21.98 feet

33. What is the area of a circle whose radius is 4 inches?

50.24 square inches

Pages 142 and 143 —— 33 points

Final Review Test

33 points:

33

1. Figure out what *B* is on the following number line.

B = 35

2. Write 371,000,000,000 in words.

three hundred seventy-one billion

3. Factor 63 two ways. 7 x 9

3 x 21

4. 16525 ÷ 8 = 2065 5/8

5. Find the average of 8, 25, and 12.

15

6. Write 7.009 in words.

seven and nine thousandths

Write twelve and fifteen hundredths in decimals.

12.15

7. 45.762 + 396 = 441.762

8. 6.8 − 2.472 = 4.328

9. Round off 45,632 to the nearest thousand.

46,000

10. Round off .6749831 to the nearest hundredth.

.67

11. 43.7 × 3.9 = 170.43

12. Write MMCCLXVII in Arabic numbers.

2267

Write 3,424 in Roman numerals.

MMMCDXXIV

13. 11.388 ÷ 2.6 = 4.38

14. Five cubed + nine squared = 206

4^5 = 1024

15. What fraction of the circle is shaded in?

7/8

16. If 9/10 of a test is right, what fraction is wrong? 1/10

17. Complete the ratios.

6 : 18 = 8 : 24

3 : 12 = 4 : 16

18. 2/3 + 1/4 = 8/12 + 3/12 = 11/12

19. Reduce the following fractions to lowest terms.

4/24 = 1/6 14/16 = 7/8

20. Write $4\frac{1}{8}$ as an improper fraction.

33/8

21. $4\frac{2}{3} + 8\frac{2}{3} = 13\frac{1}{3}$

22. $5\frac{1}{5} - 2\frac{4}{5} = 2\frac{2}{5}$

23. Write point *A* as a mixed number. Reduce your answer to lowest terms.

A = $3\frac{1}{4}$

24. $2\frac{4}{5} \times 1\frac{5}{8} = \frac{14}{5} \times \frac{13}{8} = \frac{91}{20} = 4\frac{11}{20}$

25. 1/7 + 3/14 = 1/7 x 14/3 = 2/3

26. 1/4 as a percent = 25 %

$33\frac{1}{3}$ % as a fraction = 1/3

27. 45% of 640 = 288

28. If 53% of a school is boys, what percent is girls?

47 %

29. What is the perimeter of a rectangular garden 19 feet long and 14 feet wide?

66 feet

30. What is the area of the garden in question 29?

266 square feet

31. What is the volume of a box 5 feet long, 5 feet wide, and 4 feet deep?

100 cubic feet

32. What is the circumference of a circle whose diameter is 8 feet?

25.12 feet

33. What is the area of a circle whose radius is 3 inches?

28.26 square inches