SOLUTIONS

This Teacher's Toolkit CD Solutions section includes solutions for all problems in the MATH 6 Student Text that could not fit on the Student Text page. The solutions that are numbered in black are the same solutions found in the Solutions section of the Teacher's Edition. Additional solutions provided here include the entire solutions for long division and multi-digit multipliers, drawings or illustrations, explanations, and alternative solutions. Solutions that are only in this section of the CD are numbered in blue.

Chapter 1

page 11

J

10,500	
7,983	n

Explanations may vary. Knowing that subtraction is the inverse operation for addition, I can solve by writing a subtraction problem.
$10,500 - 7,983 = n$; $n = 2,517$

page 13

41. twenty-eight million, three hundred seven thousand, thirteen;
$20,000,000 + 8,000,000 + 300,000 + 7,000 + 10 + 3$

J **Sum is the answer to an addition problem; $17 + 38 = \boxed{55}$. Difference is the answer to a subtraction problem; $55 - 38 = \boxed{17}$ or $55 - 17 = \boxed{38}$.**

page 14

4.

1,336	
987	349

5.

$3.28	
$1.39	$1.89

6.

4,500	
2,013	2,487

7.

$20	
$13.39	$6.61

8.

100 ft	
38.5 ft	61.5 ft

9.

60 min	
35 min	25 min

page 17

29.

980	
745	235

30.

3,270	
1,485	1,785

31.

97.66	
15.96	81.7

32.

4,986	
3,009	1,977

33.

21.75	
15	6.75

34.

2.75	
1.4	1.35

35.

⁻11	
⁻3	⁻8

36.

2	
4	⁻2

37.

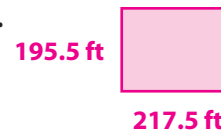| 2	
⁻1	3

41. possible answers: $0 + 10 = 10$, $10 + 0 = 10$; $1 + 9 = 10$, $9 + 1 = 10$; $2 + 8 = 10$, $8 + 2 = 10$; $3 + 7 = 10$, $7 + 3 = 10$; $4 + 6 = 10$, $6 + 4 = 10$; $5 + 5 = 10$
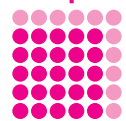
46.

195.5 ft

217.5 ft

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16.

Step 5 — 25

Step 6 — 36

18. Step 4

Step 5

Chapter 2

page 31

31. $6 \times (10 + 2) =$
$(6 \times 10) + (6 \times 2) =$
$60 + 12 = 72$

32. $8 \times (10 + 5) =$
$(8 \times 10) + (8 \times 5) =$
$80 + 40 = 120$

33. $4 \times (20 + 3) =$
$(4 \times 20) + (4 \times 3) =$
$80 + 12 = 92$

34. $5 \times (10 + 7) =$
$(5 \times 10) + (5 \times 7) =$
$50 + 35 = 85$

42. 3: 3 ⑥ ⑨ ⑫ 15 ⑱ 21 ㉔ ㉗ ㉚ 33 ㊱

6: ⑥ ⑫ ⑱ ㉔ ㉚ ㊱ 42 48 54 60 66 72

9: ⑨ ⑱ ㉗ ㊱ 45 54 63 72 81 90 99 108

43. green circles above

44. red circles above

45. No; the next multiple of 3 is 39. It is not a multiple of 6 or 9. Since 36 was *also* a multiple of 6 and 9, you would need to write 2 more multiples of 3 to find a multiple of 6 or 3 more multiples of 3 to find a multiple of 9.

page 32

1. $(3 \times 2) \times 10 =$
    $6 \times 10 = 60$

2. $(4 \times 5) \times 10 =$
    $20 \times 10 = 200$

3. $(7 \times 9) \times (10 \times 10) =$
    $63 \times 100 = 6,300$

4. $(3 \times 8) \times (10 \times 100) =$
    $24 \times 1,000 = 24,000$

page 33

22. $40 \times (60 + 8) =$
    $(40 \times 60) + (40 \times 8) =$
    $2,400 + 320 = 2,720$

23. $200 \times (10 + 3) =$
    $(200 \times 10) + (200 \times 3) =$
    $2,000 + 600 = 2,600$

24. $(70 + 5) \times 300 =$
    $(70 \times 300) + (5 \times 300) =$
    $21,000 + 1,500 = 22,500$

25. $20 \times (400 + 10 + 5) =$
    $(20 \times 400) + (20 \times 10) + (20 \times 5) =$
    $8,000 + 200 + 100 = 8,300$

26. $(20 + 1) \times 50 =$
    $(20 \times 50) + (1 \times 50) =$
    $1,000 + 50 = 1,050$

27. $80 \times (100 + 10) =$
    $(80 \times 100) + (80 \times 10) =$
    $8,000 + 800 = 8,800$

28. $40 \times (90 + 2) =$
    $(40 \times 90) + (40 \times 2) =$
    $3,600 + 80 = 3,680$

29. $(10 + 6) \times 30 =$
    $(10 \times 30) + (6 \times 30) =$
    $300 + 180 = 480$

32. $4 \times 30 = 120$; $20 \times 12 = 240$;
    $60 \times 400 = 24,000$

page 34

10. $4 \times 4 \times 4 \times 4 \times 4$

12. $2 \times 2 \times 2 \times 2$

13. $7 \times 7 \times 7 \times 7$

14. 3×3

15. $9 \times 9 \times 9$

16. $5 \times 5 \times 5 \times 5 \times 5 \times 5$

17. $1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1$

18. $6 \times 6 \times 6 \times 6 \times 6 \times 6$

19. $8 \times 8 \times 8 \times 8 \times 8$

page 37

26.
```
    78
  × 34
   312
 +2340
 2,652
```

27.
```
    42
  × 69
   378
 +2520
 2,898
```

28.
```
    289
  ×  51
    289
 +14450
 14,739
```

29.
```
   4,962
  ×   56
   29772
 +248100
 277,872
```

30.
```
    729
  ×  68
   5832
 +43740
  49,572
```

31.
```
    77
  × 75
   385
 +5390
 5,775
```

32.
```
  62,713
 ×     34
  250852
+1881390
2,132,242
```

34.
```
    180
  × 55
   900
 +9000
 9,900
```

35.
```
    112
  × 85
   560
 +8960
 9,520
```

37. $7 \times (400 + 70 + 3) =$
    $(7 \times 400) + (7 \times 70) + (7 \times 3) =$
    $2,800 + 490 + 21 = 3,311$

38. **The estimated product is greater than the product because 473 was rounded up to 500.**

Ⓙ **By multiplying 3 times each place, I am able to add the partial products and do less renaming.**
$3 \times 2,326 = 6,000 + 900 + 60 + 18 = 6,978$

page 38

5.
```
   1.98
 ×   13
    594
 +1980
  25.74
```

7.
```
  $25.05
 ×    12
    5010
 +25050
 $300.60
```

10.
```
  $4.99
 ×   11
   499
 +4990
 $54.89
```

page 40

1.
```
     498
   ×318
    3984
    4980
 +149400
 158,364
```

2.
```
     639
   ×548
    5112
   25560
 +319500
 350,172
```

3.
```
     786
   ×308
    6288
 +235800
 242,088
```

4.
```
   8,645
  ×  729
   77805
  172900
+6051500
6,302,205
```

5.
```
    784
  ×  42
   1568
 +31360
 32,928
```

6.
```
    749
  ×254
   2996
  37450
+149800
 190,246
```

7.
```
    629
  ×  36
   3774
 +18870
 22,644
```

8.
```
   9,015
  ×   72
  18030
+631050
649,080
```

9.
```
    281
  ×  77
   1967
 +19670
 21,637
```

11.
```
  $3.86
  ×  14
   1544
  +3860
 $54.04
```

13.
```
    428
  ×117
   2996
   4280
 +42800
 50,076
```

14.
```
     27
   ×15
    135
  +270
    405
```

15.
```
    150
  ×  21
    150
  +3000
  3,150
```

16.
```
    9.8
  × 11
     98
  +980
  107.8
```

20.
```
   $2.87
  ×  265
    1435
   17220
  +57400
 $760.55
```

page 41

38.
```
   $15.75
  ×    11
     1575
   +15750
  $173.25
```

39.
```
   4,890
  ×   14
   19560
  +48900
  68,460
```

page 44

16.
```
    165
  ×  56
    990
  +8250
  9,240
```

17.
```
    756
  ×  31
    756
 +22680
 23,436
```

18.
```
    953
  ×  72
   1906
 +66710
 68,616
```

19.
```
   1,795
  ×  308
   14360
 +538500
 552,860
```

28.
```
     63
  ×11
     63
  +630
    693
```

29.
$(40 + 9) \times 80 =$
$(40 \times 80) + (9 \times 80) =$
$3{,}200 + 720 = 3{,}920$

30.
$60 \times (100 + 7) =$
$(60 \times 100) + (60 \times 7) =$
$6{,}000 + 420 = 6{,}420$

31.
$(200 + 10 + 9) \times 30 =$
$(200 \times 30) + (10 \times 30) + (9 \times 30) =$
$6{,}000 + 300 + 270 = 6{,}570$

Chapter 3

page 52

11. $3 \times 8 = 24$
$8 \times 3 = 24$
$24 \div 3 = 8$
$24 \div 8 = 3$

12. $8 \times 9 = 72$
$9 \times 8 = 72$
$72 \div 8 = 9$
$72 \div 9 = 8$

13. $5 \times 12 = 60$
$12 \times 5 = 60$
$60 \div 5 = 12$
$60 \div 12 = 5$

14.
```
     53
5)265
  −25
   15
  −15
    0
```

15.
```
    9 r3
6)57
 −54
   3
```

16.
```
    172
3)516
 −3
  21
 −21
   06
 − 6
    0
```

17.
```
    50 r2
9)452
 −45
   02
```

18.
```
    82 r1
4)329
 −32
   09
  − 8
    1
```

19.
```
    4 r1
4)17
 −16
   1
```

20.
```
    35 r5
7)250
 −21
   40
  −35
    5
```

21.
```
    114 r6
8)918
 −8
  11
 − 8
   38
  −32
    6
```

22.
```
    15
5)75
 −5
  25
 −25
   0
```

23.
```
    91
8)728
 −72
   08
  − 8
    0
```

page 53

24. $20 \div 5 = 4$

20				
4	4	4	4	4

25. $40 \div 4 = 10$

40									
4	4	4	4	4	4	4	4	4	4

26. $96 \div 8 = 12$

96							
12	12	12	12	12	12	12	12

27.
```
    109 r1
2)219
 −2
  019
  −18
    1
```

28.
```
    5 r2
6)32
 −30
   2
```

29.
```
    149 r6
7)1,049
 − 7
   34
  −28
   69
  −63
    6
```

30.
```
    52
7)364
 −35
   14
  −14
    0
```

32.
```
    124
5)620
 −5
  12
 −10
   20
  −20
    0
```

33.
```
    370
  ×  49
   3330
 +14800
 18,130
```

39.
```
      15
  6)90
    -6
    30
   -30
     0
```

J

r
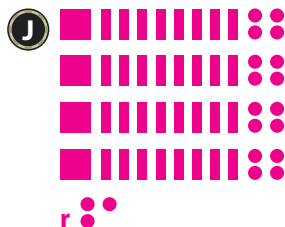
page 54

7.
```
    1,263
5)6,315
  -5
   13
  -10
   31
  -30
   15
  -15
    0
```

8.
```
    274
4)1,096
  -8
   29
  -28
   16
  -16
    0
```

9.
```
    598 r6
8)4,790
  -40
   79
  -72
   70
  -64
    6
```

10.
```
    315
3)945
  -9
   04
  -3
   15
  -15
    0
```

11.
```
    911
9)8,199
  -81
   09
  -9
   09
  -9
    0
```

12.
```
     24
20)480
  -40
   80
  -80
    0
```

13.
```
      53
30)1,590
  -150
    90
   -90
     0
```

14.
```
      40 r43
50)2,043
  -200
    43
  - 0
    43
```

15.
```
      32
80)2,560
  -240
   160
  -160
     0
```

16.
```
      64 r25
70)4,505
  -420
   305
  -280
    25
```

17.
```
      62
30)1,860
  -180
    60
  -60
    0
```

18.
```
    22 r9
30)669
  -60
   69
  -60
    9
```

19.
```
     9 r5
80)725
 -720
    5
```

20.
```
    124 r5
20)2,485
  -20
   48
  -40
   85
  -80
    5
```

21.
```
    530 r7
10)5,307
  -50
   30
  -30
   07
```

page 55

27.
```
    29
5)145
-10
  45
 -45
   0
```

28.
```
     18 r1
8)145
  -8
   65
  -64
    1
```

29.
```
     36 r1
4)145
  -12
   25
  -24
    1
```

30.
```
    25 r4
5)129
 -10
   29
  -25
    4
```

32.
```
    43
3)129
 -12
   09
 - 9
   0
```

33.

34.

35.

The 2 remaining segments could be given to the parents.

page 56

10.
```
        18
   52)936
     − 52
      416
    − 416
        0
```

11.
```
          214
   18)3,852
     − 36
       25
     − 18
       72
     − 72
        0
```

12.
```
          57 r21
   33)1,902
     − 165
       252
     − 231
        21
```

13.
```
          98 r14
   30)2,954
     − 270
       254
     − 240
        14
```

14.
```
          95 r11
   41)3,906
     − 369
       216
     − 205
        11
```

15.
```
          213
   7)1,491
     − 14
       09
     −  7
       21
     − 21
        0
```

16.
```
         203
   25)5,075
     − 50
       075
     −  75
         0
```

17.
```
        5,110 r4
   12)61,324
     − 60
       13
     − 12
       12
     − 12
       0 4
```

18.
```
         1,865 r23
   51)95,138
     − 51
       441
     − 408
       333
     − 306
       278
     − 255
        23
```

19.
```
          199 r7
   9)1,798
     −  9
       89
     − 81
       88
     − 81
        7
```

20. 135 is divisible by 5 because the ones digit is a 5; it is not divisible by 10 because the ones digit is not a 0.

21. 642 is divisible by 2 because it is even; it is divisible by 3 because the sum of the digits (12) is divisible by 3; it is not divisible by 4 because the last 2 digits (42) are not divisible by 4; it is divisible by 6 because it is divisible by 2 and 3.

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22. The 1 remaining card was given to their sister.

22.
```
      12 r1
   3)37
    −3
     07
      6
      1
```

23. Another table is needed for the 2 remaining guests.

23.
```
       17 r2
   8 )138
    − 8
      58
    − 56
       2
```

24. The 12 remaining cookies could be bagged as only 1 dozen.

24.
```
          62 r12
   24)1,500
     − 144
        60
     −  48
        12
```

25. The remaining 5 books could be placed on 5 of the shelves or the 5 books could be displayed on a separate shelf.

25.
```
          51 r5
   37)1,892
     − 185
        42
     −  37
         5
```

26. The remaining 5 flowers could be planted in 5 of the rows or planted in another location

26.
```
         25 r5
   15)380
     − 30
        80
     −  75
         5
```

27.
```
        150
  20)3,000
    − 20
      100
    − 100
        00
```

34. Possible answer: The owners of a pumpkin patch placed all 198 of their pumpkins in 18 containers. How many pumpkins were in each container? 198 ÷ 18 = 11 pumpkins

34.
```
       11
  18)198
    − 18
      18
    − 18
       0
```

36. 360 ÷ 20 = 18 popcorn balls (finding the number in each set); 360 ÷ 20 = 18 baskets (finding the number of sets)

36.
```
       18
  20)360
    − 20
     160
   − 160
       0
```

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1.
```
      $1.50
  4)$6.00
    −4
     20
   − 20
      0
```

2.
```
      2.5
  8)20.0
   − 16
      40
    − 40
      0
```

3.
```
       6.25
  4)25.00
    − 24
      10
    −  8
       20
     − 20
        0
```

4.
```
      12.5
  8)100.0
   −  8
      20
   − 16
      40
    − 40
       0
```

5.
```
      11.6
  5)58.0
   − 5
     08
   −  5
      30
    − 30
       0
```

6.
```
     $153.50
  2)$307.00
   −2
    10
  − 10
     07
   −  6
      10
    − 10
       0
```

7.
```
      100.75
  4)403.00
   −4
    0030
   −  28
      20
    − 20
       0
```

8.
```
      5.75
  8)46.00
   − 40
     60
   − 56
      40
    − 40
       0
```

13.
```
      1.97
  9)17.73
   − 9
     87
   − 81
      63
    − 63
       0
```

14.
```
       3.196
  8)25.568
   − 24
     15
   −  8
      76
    − 72
       48
     − 48
        0
```

15.
```
      11.845
  4)47.380
   − 4
     07
   −  4
      33
    − 32
       18
     − 16
        20
      − 20
         0
```

16.
```
      94.45
  2)188.90
   − 18
     08
   −  8
      09
    −  8
       10
     − 10
        0
```

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17.
```
     0.5
  4)2.0
   − 20
      0
```

18.
```
     0.5
  8)4.0
   − 40
      0
```

19.
```
     0.2
  10)2.0
    − 20
       0
```

20.
```
      0.125
  8)1.000
   − 8
     20
   − 16
      40
    − 40
       0
```

27.
```
       4 1/4
  4)17
   − 16
      1
```

28.
```
       4 1/8
  8)33
   − 32
      1
```

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1.
```
       14.285
  7)100.000
   −  7
      30
    − 28
       20
     − 14
        60
      − 56
         40
       − 35
          5
```

2.
```
       1.621
  37)60.000
    − 37
      230
    − 222
        80
      − 74
         60
       − 37
          23
```

3.
```
        13.555
  18)244.000
    − 18
      64
    − 54
      100
    − 90
      100
    − 90
      100
    − 90
       10
```

4.
```
        19.826
  23)456.000
    − 23
      226
    − 207
      190
    − 184
        60
      − 46
        140
      − 138
          2
```

5.
```
       45.473
   19)864.000
     −76
      104
     − 95
        90
       −76
       140
      −133
         70
        −57
         13
```

6.
```
      $1.062
    4)$4.250
     −4
      025
     − 24
        10
       − 8
         2
```

7.
```
       $3.605
   17)$61.300
     −51
      103
     −102
       100
      − 85
        15
```

8.
```
       $0.923
   37)$34.180
     −333
       88
      −74
       140
      −111
        29
```

9.
```
      $0.85
   13)$11.05
     − 104
        65
      − 65
         0
```

10.
```
       $1.983
   40)$79.350
     −40
      393
     −360
       335
      −320
       150
      −120
        30
```

11.
```
       3.55
   18)64.00
     −54
      100
     − 90
      100
     − 90
       10
```

12.
```
      9.75
    4)39.00
     −36
       30
      −28
        20
       −20
         0
```

13.
```
     $0.59        $0.74
   4)$2.36      2)$1.48
    −20          −14
      36           08
    −36          − 8
      0            0
```

14.
```
        2.5
   40)100.0
     − 80
      200
     −200
        0
```

16.
```
      $134.646
    3)$403.940
     −3
      10
     − 9
       13
      −12
        19
       −18
         14
        −12
          20
         −18
           2
```

21.
```
         5
   84)420
     −420
        0
```

22.
```
        11
   55)605
     −55
       55
     −55
        0
```

23.
```
       213
   16)3,408
     −32
       20
      −16
        48
       −48
         0
```

24.
```
        24
   11)264
     −22
       44
      −44
        0
```

25.
```
       51
    7)357
     −35
       07
      − 7
        0
```

26.
```
       52
   12)624
     −60
       24
      −24
        0
```

27.
```
       46.5
    4)186.0
     −16
       26
      −24
        20
       −20
         0
```

28.
```
        0.15
   82)12.30
     − 82
       410
      −410
         0
```

29.
```
        162.5
   18)2,925.0
     − 18
       112
      −108
         45
        −36
          90
         −90
           0
```

30.
```
        9.75
   40)390.00
     −360
       300
      −280
       200
      −200
         0
```

31.
```
       15.035
   16)240.560
     −16
       80
      −80
       056
      − 48
        80
       −80
         0
```

32.
```
       162
   11)1,782
     −11
       68
       66
       22
       22
        0
```

33.
```
      $39.13
    3)$117.39
     − 9
       27
      −27
        03
       − 3
         09
        − 9
          0
```

35.
```
       270
    6)1,620
     −12
       42
       42
        0
```

36.
```
      2,748.33
3)8,245.00
 −6
  22
 −21
   14
  −12
    25
   −24
     10
    − 9
      10
     − 9
       1
```

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9.
```
    3.25
3)9.75
 −9
  07
 − 6
   15
  −15
    0
```

10.
```
    1.218
5)6.090
 −5
  10
 −10
   09
  − 5
    40
   −40
     0
```

11.
```
    1.28
6)7.68
 −6
  16
 −12
   48
  −48
    0
```

12.
```
     6.125
4)24.500
 −24
   05
  − 4
    10
   − 8
     20
    −20
      0
```

13.
```
    0.097
80)7.760
  −720
   560
  −560
     0
```

14.
```
     0.409
30)12.270
  −120
   270
  −270
     0
```

15.
```
   106.7
5)533.5
 −5
  033
 − 30
   35
  −35
    0
```

16.
```
    $4.10
4)$16.40
 −16
   04
  − 4
    0
```

17.
```
     $2.51
25)$62.75
  −50
   127
  −125
    25
   −25
     0
```

page 63

26.
```
       14
682)9,548
  −682
   2728
  −2728
      0
```

27.
```
        0.232
112)26.090
   −224
    369
   −336
    330
   −224
    106
```

28.
```
        2.017
180)363.140
   −360
    314
   −180
    1340
   −1260
      80
```

29.
```
       16            174
174)2,784          ×  16
  −174             1044
   1044          +1740
  −1044           2,784
      0
```

30.
```
        87            283
283)24,621          ×  87
  −2264            1981
   1981          +22640
  −1981           24,621
      0
```

31.
```
        103            364
364)37,492          ×103
  −364             1092
   1092          +36400
  −1092           37,492
      0
```

35.
```
       933
18)16,794
  −162
    59
   −54
    54
   −54
     0
```

J a. added the digits in the 2 greatest places

b. subtracted the digits in the 2 greatest places

c. multiplied the multiplier (5) times the digits in the 2 greatest places of the multiplicand

d. divided the 2 greatest places of the dividend by the divisor (12)

page 64

7. 5×9
45

8. $6 \times 6 + 4$
$36 + 4$
40

9. $28 + 2$
30

10. $16 \div 2 \times 8$
8×8
64

11. 6×16
96

12. $36 - 4$
32

13. $10 + 16$
26

14. $37 - 12 \div 2$
$37 - 6$
31

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15. $48 \div (2 + 4)$
$48 \div 6$
8

16. $10^3 \times 8$
$1,000 \times 8$
8,000

17. $4 - 3 + 8 + 9$
$1 + 8 + 9$
$9 + 9$
18

18. $5 + 12 \div (6 - 2)$
$5 + 12 \div 4$
$5 + 3$
8

19. $3^2 \times 7$
9×7
63

20. $2{,}500 \div 100$
25

21. 5^2
25

22. $7 + 10 - 30 \div 5$
$7 + 10 - 6$
$17 - 6$
11

29.
$$\begin{array}{r} 29 \\ 25\overline{)725} \\ -50 \\ \hline 225 \\ -225 \\ \hline 0 \end{array}$$

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5. $5 + 3 \times 10$
$5 + 30$
35

6. $8 \times 4 + 6$
$32 + 6$
38

7. $5 + 24$
29

8. $24 - 2 \times 2$
$24 - 4$
20

9. $8 + 8 + 2 \times 16$
$8 + 8 + 32$
$16 + 32$
48

10. $24 \div 8 + 5^2$
$24 \div 8 + 25$
$3 + 25$
28

11. $10 + 24 - 1$
$34 - 1$
33

12. $12 - 2 + 5$
$10 + 5$
15

13. $54 - 2^2 + 6$
$54 - 4 + 6$
$50 + 6$
56

18.
$$\begin{array}{r} 91 \\ 4\overline{)364} \\ -36 \\ \hline 04 \\ -4 \\ \hline 0 \end{array}$$

19.
$$\begin{array}{r} 12 \\ \times 16 \\ \hline 72 \\ +120 \\ \hline 192 \end{array}$$

21.
$$\begin{array}{r} \$0.14 \\ 12\overline{)\$1.68} \\ -12 \\ \hline 48 \\ -48 \\ \hline 0 \end{array}$$

25.
$$\begin{array}{r} 0.14 \\ 5\overline{)0.70} \\ -5 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

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13.
$$\begin{array}{r} 34 \\ 8\overline{)272} \\ -24 \\ \hline 32 \\ -32 \\ \hline 0 \end{array}$$

14.
$$\begin{array}{r} 254 \\ 3\overline{)762} \\ -6 \\ \hline 16 \\ -15 \\ \hline 12 \\ -12 \\ \hline 0 \end{array}$$

15.
$$\begin{array}{r} 79 \\ 7\overline{)553} \\ -49 \\ \hline 63 \\ -63 \\ \hline 0 \end{array}$$

16.
$$\begin{array}{r} 43 \\ 9\overline{)387} \\ -36 \\ \hline 27 \\ -27 \\ \hline 0 \end{array}$$

17.
$$\begin{array}{r} 379 \\ 2\overline{)758} \\ -6 \\ \hline 15 \\ -14 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$$

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28.
$$\begin{array}{r} 0.12 \\ 8\overline{)0.96} \\ -8 \\ \hline 16 \\ -16 \\ \hline 0 \end{array}$$

29.
$$\begin{array}{r} 0.582 \\ 3\overline{)1.746} \\ -15 \\ \hline 24 \\ -24 \\ \hline 06 \\ -6 \\ \hline 0 \end{array}$$

30.
$$\begin{array}{r} 5.64 \\ 8\overline{)45.12} \\ -40 \\ \hline 51 \\ -48 \\ \hline 32 \\ -32 \\ \hline 0 \end{array}$$

31.
$$\begin{array}{r} 0.25 \\ 4\overline{)1.00} \\ -8 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

32.
$$\begin{array}{r} 0.2 \\ 5\overline{)1.0} \\ -10 \\ \hline 0 \end{array}$$

33.
$$\begin{array}{r} 41\,r2 \\ 3\overline{)125} \\ -12 \\ \hline 05 \\ -3 \\ \hline 2 \end{array}$$

34.
$$\begin{array}{r} \$42.50 \\ 4\overline{)\$170.00} \\ -16 \\ \hline 10 \\ -8 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

37.
$$\begin{array}{r} 16.666 \\ 3\overline{)50.000} \\ -3 \\ \hline 20 \\ -18 \\ \hline 20 \\ -18 \\ \hline 20 \\ -18 \\ \hline 20 \\ -18 \\ \hline 2 \end{array}$$

38.
$$\begin{array}{r} \$12.05 \\ 40\overline{)\$482.00} \\ -40 \\ \hline 82 \\ -80 \\ \hline 200 \\ -200 \\ \hline 0 \end{array}$$

41. 3 + 56
59

42. 54 ÷ 3
18

43. 18 − 5
13

44. 6 × 2
12

45. 20 × 5
100

46.
```
        33 r22
53) 1,771
   − 159
     181
   − 159
      22
```

47.
```
            23
574) 13,202
    − 1148
      1722
    − 1722
         0
```

48.
```
         25
175) 4,375
   − 350
     875
   − 875
       0
```

49.
```
       43.75
4) 175.00
 − 16
   15
 − 12
    30
  − 28
     20
   − 20
      0
```

50.
```
       11.52
75) 864.00
  − 75
   114
 −  75
    390
  − 375
    150
  − 150
      0
```

51.
```
       120.15
80) 9,612.00
  − 80
   161
 − 160
    120
  −  80
    400
  − 400
      0
```

Chapter 4

page 78

7.

```
      16
     / \
    4 · 4
   /|   |\
  2·2 · 2·2
```
16: 2^4

```
      18
     / \
    2 · 9
       / \
      2·3·3
```
18: $2 · 3^2$

8.

```
       24
      / \
     4 · 6
    /|   |\
   2·2 · 2·3
```
24: $2^3 · 3$

```
       56
      / \
     7 · 8
        / \
     7·2 · 4
    /|   |   |\
   7·2 · 2·2
```
56: $2^3 · 7$

9.

```
    14
   / \
  2 · 7
```
14: 2 · 7

```
    25
   / \
  5 · 5
```
25: 5^2

10.

```
    13
   / \
  1 · 13
```

```
    21
   / \
  3 · 7
```

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20.
```
      12
     / \
    3 · 4
       / \
    3 · 2 · 2
```

21.
```
      16
     / \
    4 · 4
   /|   |\
  2·2 · 2·2
```

22.
```
      56
     / \
    7 · 8
       / \
    7 · 2 · 4
   /|   |   |\
  7 · 2 · 2 · 2
```

23.
```
      72
     / \
    8 · 9
   / \   / \
  2·4 · 3·3
 /|  |\  |   |
2·2·2 · 3·3
```

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9.

10.

11.

12.

page 82

5.

6.

7.

8.

9.

10.

11.

12.

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13.
```
       5
2) 10
 − 10
    0
```

14.
```
      2 2/5
5) 12
 − 10
    2
```

15. $3 \cdot \frac{4}{4} = \frac{12}{4}; \frac{12}{4} + \frac{1}{4} = \frac{13}{4}$

16. $4 \cdot \frac{5}{5} = \frac{20}{5}; \frac{20}{5} + \frac{1}{5} = \frac{21}{5}$

17. $1 \cdot \frac{10}{10} = \frac{10}{10}; \frac{10}{10} + \frac{9}{10} = \frac{19}{10}$

18.
```
      7 3/4
  4)31
   -28
     3
```

19.
```
      4 1/6
  6)25
   -24
     1
```

20. $5 \cdot \frac{3}{3} = \frac{15}{3}; \frac{15}{3} + \frac{2}{3} = \frac{17}{3}$

21.
```
      9
  3)27
   -27
     0
```

22. $2 \cdot \frac{8}{8} = \frac{16}{8}; \frac{16}{8} + \frac{5}{8} = \frac{21}{8}$

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40. go-carts;

bowling: $\frac{1}{3} = \frac{5}{15}$;

miniature golf: $\frac{4}{15}$;

go carts: $\frac{2}{5} = \frac{6}{15}$;

$\frac{6}{15} > \frac{5}{15}$ and $\frac{6}{15} > \frac{4}{15}$

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9. $\frac{7}{10} = 0.7$
```
       0.8
  15)12.0
    -120
       0
```

10.
```
      0.3333          0.3913
  3)1.0000        23)9.0000
   - 9              -69
    10              210
   - 9             -207
    10               30
   - 9              -23
    10               70
   - 9              -69
     1                1
```

11.
```
      0.2            0.2
  70)14.0         5)1.0
   -140            -10
      0              0
```

12.
```
      0.75            0.8
  4)3.00          25)20.0
   -28             -200
    20                0
   -20
     0
```

13.
```
      0.6190          0.6122
  21)13.0000      49)30.0000
   -126            -294
    40              60
   -21             -49
    190            110
   -189           - 98
     10            120
                  - 98
                    22
```

14.
```
      0.8            0.7142
  5)4.0          7)5.0000
   -40            -49
     0             10
                 - 7
                  30
                 -28
                  20
                 -14
                   6
```

15.
```
      0.6315          0.6153
  19)12.0000      13)8.0000
   -114            -78
    60              20
   -57             -13
    30              70
   -19             -65
    110             50
   - 95            -39
     15             11
```

16. $\frac{3}{10} = 0.3$
```
      0.3636
  11)4.0000
   -33
    70
   -66
    40
   -33
    70
   -66
     4
```

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42.
```
      0.375           0.8
  8)3.000         5)4.0
   -24             -40
    60               0
   -56
    40
   -40
     0
```

43.
```
      0.5714          5
  7)4.0000          ── = 0.5
   -35             10
    50
   -49
    10
   - 7
    30
   -28
     2
```

Chapter 5

page 101

36.
$$
\begin{array}{r}
14 \\
15\overline{)210} \\
-15 \\
\hline
60 \\
-60 \\
\hline
0
\end{array}
$$

38.
$$
\begin{array}{r}
216 \\
\times \ 15 \\
\hline
1080 \\
+2160 \\
\hline
3{,}240
\end{array}
$$

40.
$$
\begin{array}{r}
\$5.25 \\
3\overline{)\$15.75} \\
-15 \\
\hline
07 \\
-\ 6 \\
\hline
15 \\
-15 \\
\hline
0
\end{array}
$$

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43.
$$
\begin{array}{r}
165 \\
27\overline{)4{,}455} \\
-27 \\
\hline
175 \\
-162 \\
\hline
135 \\
-135 \\
\hline
0
\end{array}
$$

44.
$$
\begin{array}{r}
35 \\
25\overline{)875} \\
-75 \\
\hline
125 \\
-125 \\
\hline
0
\end{array}
$$

46.
$$
\begin{array}{r}
120 \\
\times \ 16 \\
\hline
720 \\
+1200 \\
\hline
1{,}920
\end{array}
$$

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41.
$$
\begin{array}{r}
52\frac{2}{4} = 52\frac{1}{2} \\
4\overline{)210} \\
-20 \\
\hline
10 \\
-\ 8 \\
\hline
2
\end{array}
$$

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23.
$$
\begin{array}{r}
2.5 \\
\times \ 27 \\
\hline
175 \\
+500 \\
\hline
67.5
\end{array}
$$

Chapter 6

page 121
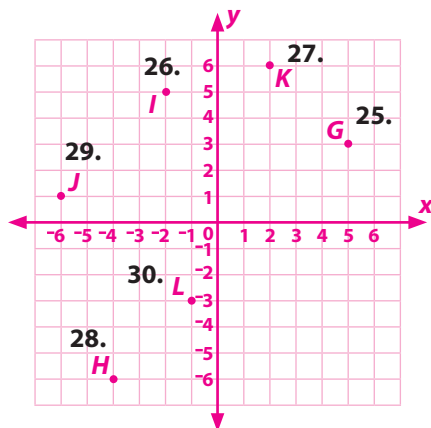
J To graph each point, you must first move 3 units to the right along the *x*-axis. However, to graph the *y*-coordinate for (3, ⁻6), you move down 6 units along the *y*-axis; and to graph the *y*-coordinate for (3, 6), you move up 6 units along the *y*-axis.

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1. **Angles will vary.**

2.

3.

4. •*M*

5.

6.
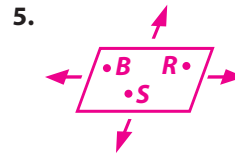
page 125

39.
$$
\begin{array}{r}
215 \\
\times \ 12 \\
\hline
430 \\
+2150 \\
\hline
2{,}580
\end{array}
$$

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9. **No; the sum of the two acute angles can be less than or greater than 90°.**

10. **Obtuse angles are greater than 90°, so the sum of two obtuse angles will always be greater than 90°.**

11. **A right angle measures 90° and 90° + 90° = 180°.**

12. **No; obtuse angles are greater than 90° so the sum of two obtuse angles is always greater than 180°.**

13. **Supplementary ; perpendicular lines form two right angles, 90° + 90° = 180°.**

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29.
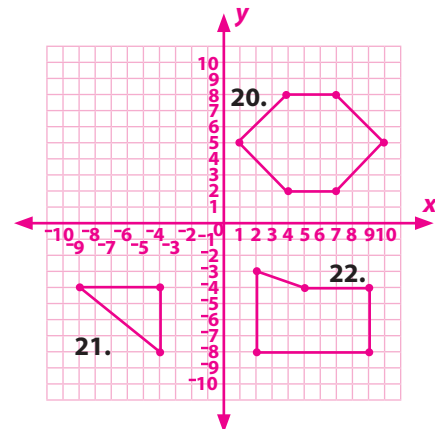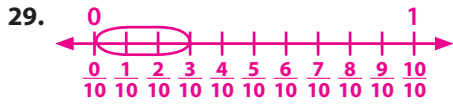
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1. **2 pairs of opposite sides parallel; opposite sides congruent; opposite angles congruent**

2. **1 pair of opposite sides parallel**

3. **2 pairs of opposite sides parallel; opposite sides congruent; all right angles**

4. **2 pairs of opposite sides parallel; all sides congruent; all right angles**

5. **4 sides
4 vertices
4 angles**

6. **2 pairs of opposite sides parallel; all sides congruent; opposite angles congruent**

12. **A square has all the properties of a rectangle: 2 pairs of opposite sides parallel; opposite sides congruent; all right angles.**

13. **No; all 4 sides of a rectangle are not always congruent.**

14. **No; a trapezoid needs to have only 1 pair of opposite sides parallel.**

15. **A rectangle has all the properties of a parallelogram: 2 pairs of opposite sides parallel; opposite sides congruent; opposite angles congruent.**

16. **No; all 4 sides of a parallelogram are not always congruent.**

page 133
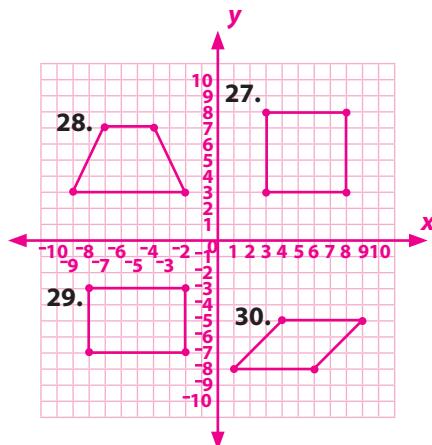
page 135

28.
$$\begin{array}{r} 3.78 \\ \times24 \\ \hline 1512 \\ +7560 \\ \hline 90.72 \end{array}$$

29.
$$\begin{array}{r} (20+1)\times 60 \\ (20\times 60)+(1\times 60) \\ 1{,}200+60 \\ 1{,}260 \end{array}$$

J **If the figures are exactly the same shape and size, they are similar but more specifically they are congruent.**

page 136
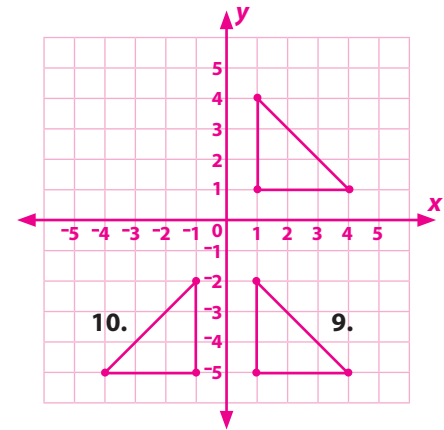
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20. **Isosceles; only one line can be drawn to divide the isosceles triange into congruent halves.**

21. **Equilateral; three different lines can be drawn to divide the equilateral into congruent halves.**

22. **Scalene; no lines can be drawn to divide the scalene triangle into congruent halves.**
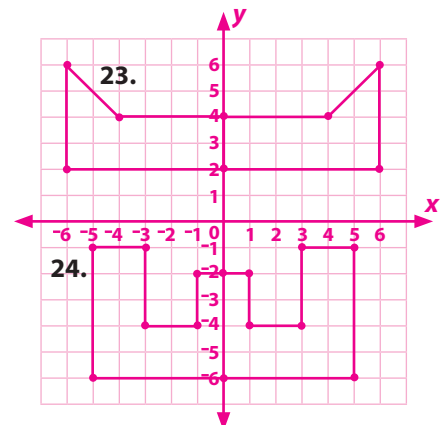
Chapter 7

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

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

3. $\frac{4}{7} + \frac{4}{7} + \frac{4}{7} = \frac{12}{7} = 1\frac{5}{7}$

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

5. $\frac{2}{9} + \frac{2}{9} + \frac{2}{9} + \frac{2}{9} = \frac{8}{9}$

6. $\frac{1}{5} \times \frac{10}{1} = \frac{10}{5} = 2$ stamps
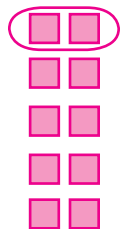
7. $\frac{2}{3} \times \frac{12}{1} = \frac{24}{3} = 8$ marbles
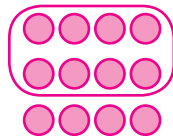
8. $\frac{1}{2} \times \frac{9}{1} = \frac{9}{2} = 4\frac{1}{2}$ squares

22. $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$

23. $\frac{1}{2} \times \frac{4}{7} = \frac{4}{14} = \frac{2}{7}$

24. $\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$

25. $\frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$
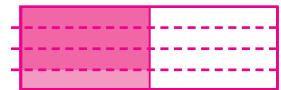
J The figure could be divided in fourths drawing 3 horizontal lines. Shade $\frac{3}{4}$ of the figure. The parts that are double shaded show the product. $\frac{3}{4} \times \frac{5}{8} = \frac{15}{32}$

1. $\frac{3 \times \overset{1}{\cancel{2}} \times \overset{1}{\cancel{2}}}{\underset{1}{\cancel{2}} \times \underset{1}{\cancel{2}} \times 2 \times 5} = \frac{3}{10}$

2. $\frac{\overset{1}{\cancel{8}} \times 3}{7 \times 2 \times \underset{1}{\cancel{5}}} = \frac{3}{14}$

3. $\frac{\overset{1}{\cancel{2}} \times \overset{1}{\cancel{3}}}{\underset{1}{\cancel{3}} \times \underset{1}{\cancel{2}} \times 2} = \frac{1}{2}$

4. $\frac{\overset{1}{\cancel{3}} \times \overset{1}{\cancel{3}} \times \overset{1}{\cancel{5}}}{2 \times \underset{1}{\cancel{5}} \times 2 \times \underset{1}{\cancel{3}} \times \underset{1}{\cancel{3}}} = \frac{1}{4}$

9. $\frac{\overset{4}{\cancel{8}}}{\underset{3}{\cancel{9}}} \times \frac{\overset{1}{\cancel{3}}}{\underset{5}{\cancel{10}}} = \frac{4}{15}$

10. $\frac{\overset{1}{\cancel{5}}}{\underset{1}{7}} \times \frac{\overset{2}{\cancel{14}}}{\underset{3}{\cancel{15}}} = \frac{2}{3}$

11. $\frac{8}{\underset{3}{\cancel{9}}} \times \frac{\overset{2}{\cancel{6}}}{7} = \frac{16}{21}$

12. $\frac{4}{\underset{1}{\cancel{5}}} \times \overset{2}{\cancel{10}} = 8$

13. $\frac{5}{\underset{4}{\cancel{12}}} \times \overset{5}{\cancel{15}} = \frac{25}{4} = 6\frac{1}{4}$

14. $\frac{\overset{3}{\cancel{15}}}{\underset{7}{\cancel{28}}} \times \frac{\overset{3}{\cancel{12}}}{\underset{7}{\cancel{35}}} = \frac{9}{49}$

15. $\frac{1}{\underset{1}{\cancel{4}}} \times \frac{\overset{1}{\cancel{4}}}{9} = \frac{1}{9}$

18. $\frac{1}{\underset{1}{\cancel{3}}} \times \overset{2}{\cancel{6}} = 2$

19. $\frac{7}{\underset{5}{\cancel{10}}} \times \frac{\overset{1}{\cancel{2}}}{9} = \frac{7}{45}$

20. $\frac{\cancel{14}^{7}}{\cancel{30}_{2}} \times \frac{\cancel{18}^{1}}{\cancel{32}_{16}} = \frac{7}{32}$

21. $\frac{1}{\cancel{2}_{1}} \times \frac{\cancel{4}^{2}}{5} = \frac{2}{5}$

22. $\frac{1}{\cancel{8}_{4}} \times \frac{\cancel{2}^{1}}{3} = \frac{1}{12}$

23. $\cancel{8}^{2} \times \frac{5}{\cancel{12}_{3}} = 3\frac{1}{3} = \frac{10}{3}$

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7. $\frac{41}{\cancel{10}_{2}} \times \frac{\cancel{5}^{1}}{6} = \frac{41}{12} = 3\frac{5}{12}$

8. $\frac{5}{\cancel{4}_{2}} \times \frac{\cancel{10}^{5}}{3} = \frac{25}{6} = 4\frac{1}{6}$

9. $\frac{3}{8} \times \frac{29}{4} = \frac{87}{32} = 2\frac{23}{32}$

10. $\frac{1}{\cancel{2}_{1}} \times \frac{\cancel{74}^{37}}{9} = \frac{37}{9} = 4\frac{1}{9}$

11. $\frac{\cancel{9}^{3}}{\cancel{4}_{2}} \times \frac{\cancel{2}^{1}}{\cancel{3}_{1}} = \frac{3}{2} = 1\frac{1}{2}$

12. $\frac{6}{\cancel{7}_{1}} \times \frac{\cancel{42}^{6}}{5} = \frac{36}{5} = 7\frac{1}{5}$

13. $\frac{11}{\cancel{5}_{1}} \times \frac{\cancel{20}^{4}}{3} = \frac{44}{3} = 14\frac{2}{3}$

14. $\frac{28}{5} \times \frac{4}{1} = \frac{112}{5} = 22\frac{2}{5}$

15. $\frac{\cancel{7}^{1}}{\cancel{8}_{2}} \times \frac{\cancel{52}^{13}}{\cancel{7}_{1}} = \frac{13}{2} = 6\frac{1}{2}$

16. $7\frac{3}{10}$ ft $\times 1\frac{1}{2}$ ft =

$\frac{73}{10}$ ft $\times \frac{3}{2}$ ft =

$\frac{219}{20}$ square feet =

$10\frac{19}{20}$ square feet

17. $2\frac{1}{5}$ yd $\times 1\frac{9}{16}$ yd =

$\frac{11}{1\cancel{5}} $ yd $\times \frac{\cancel{25}^{5}}{16}$ yd =

$\frac{55}{16}$ square yards =

$3\frac{7}{16}$ square yards

18. $(3 \times 5) + (\frac{3}{1} \times \frac{1}{2}) = 15 + 1\frac{1}{2} = 16\frac{1}{2}$

19. $(\frac{3}{4} \times \frac{4}{1}) + (\frac{3}{4} \times \frac{5}{8}) = 3 + \frac{15}{32} = 3\frac{15}{32}$

20. $(16 \times 10) + (\frac{4}{5} \times \frac{10}{1}) = 160 + 8 = 168$

21. $(9 \times 12) + (\frac{9}{1} \times \frac{2}{3}) = 108 + 6 = 114$

22. $(\frac{2}{1} \times \frac{5}{8}) + (\frac{1}{3} \times \frac{5}{8}) = \frac{5}{4} + \frac{5}{24} =$
$\frac{30}{24} + \frac{5}{24} = \frac{35}{24} = 1\frac{11}{24}$

23. $(\frac{7}{1} \times \frac{6}{7}) + (\frac{1}{2} \times \frac{6}{7}) = 6 + \frac{3}{7} = 6\frac{3}{7}$

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37.
```
   2.81
 ×   17
  1967
+ 2810
 47.77
```

38.
```
   16.5
 ×  407
   1155
+ 66000
 6,715.5
```

39.
```
        34.924
 5)174.620
   −15
     24
    −20
     46
    −45
     12
    −10
      20
     −20
       0
```

J 8 sets of $1\frac{1}{2}$
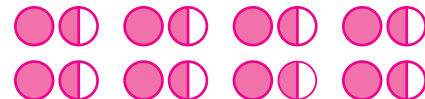
$1\frac{1}{2}$ sets of 8
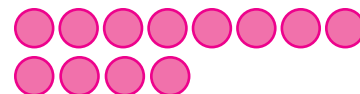
$8 \times 1\frac{1}{2} = 1\frac{1}{2} + 1\frac{1}{2} + 1\frac{1}{2} + 1\frac{1}{2} + 1\frac{1}{2} + 1\frac{1}{2} +$
$1\frac{1}{2} + 1\frac{1}{2} = 8\frac{8}{2} = 12$

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9.
```
  $0.59
 ×   18
   472
 + 590
 $10.62
```

11.
```
    2.68
 ×   9.4
   1072
+ 24120
 25.192
```

12.
```
   23.4
 ×  3.2
   468
+ 7020
 74.88
```

13.
```
   32.6
 ×  0.8
  26.08
```

14.
```
    7.05
 ×  1.56
   4230
  35250
+ 70500
 10.9980
```

15.
```
    6.56
 ×  3.25
   3280
  13120
+ 196800
 21.3200
```

16. $(3 \times 13) + (3 \times 0.25) =$
$39 + 0.75 = 39.75$

17. $(8 \times 32) + (8 \times 0.6) =$
$256 + 4.8 = 260.8$

18. $(0.8 \times 10) + (0.8 \times 0.3) =$
$8 + 0.24 = 8.24$

19. $(0.5 \times 50) + (0.5 \times 0.2) =$
$25 + 0.1 = 25.1$

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29. $3 \times 1.69 = 5.07$ oz
$2 \times 2.48 = 4.96$ oz

30. $3 \times \$24.95 = \$74.85$
$\$74.85 - \$10.00 = \$64.85$

31. $180° - (60° + 60°) =$
$180° - 120° = 60°$

32. $180° - (60° + 90°) =$
$180° - 150° = 30°$

33. $180° - 100° = 80°$

35. Congruent

Similar

36.
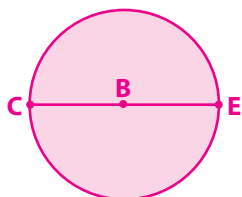
The product will be less than 45 because 0.6 is finding only part of a whole. The product will be greater than 20 because 0.6 is greater than $\frac{1}{2}$.

0.6 of 45 is > 20

$\frac{1}{2}$ of 45 is $22\frac{1}{2}$

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6.
$$23.4$$
$$\times\ 3.2$$
$$468$$
$$+7020$$
$$74.88$$

10.
$$2.68$$
$$\times\ 9.4$$
$$1072$$
$$+24120$$
$$25.192$$

15.
$$10.01$$
$$\times\ 2.1$$
$$1001$$
$$+20020$$
$$21.021$$

16.
$$\$1.15$$
$$\times\ 3.4$$
$$460$$
$$+3450$$
$$\$3.910$$

17.
$$\$6.49$$
$$\times\ 0.75$$
$$3245$$
$$+45430$$
$$\$4.8675$$

18.
$$\$6.49$$
$$\times\ 2$$
$$\$12.98$$

$$\$3.79$$
$$\times\ 1.5$$
$$1895$$
$$+3790$$
$$\$5.685$$

19.
$$\$3.79$$
$$\times\ 1.5$$
$$1895$$
$$+3790$$
$$\$5.685$$

20.
$$\$6.49$$
$$\times\ 3.25$$
$$3245$$
$$12980$$
$$+194700$$
$$\$21.0925$$

$$\$3.79$$
$$\times\ 2.5$$
$$1895$$
$$+7580$$
$$\$9.475$$

$$\$4.19$$
$$\times\ 1.75$$
$$2095$$
$$29330$$
$$+41900$$
$$\$7.3325$$

$$\$21.09$$
$$+\ \$9.48$$
$$\$37.90$$

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7. $\frac{52}{10} \times \frac{50}{8} = \frac{65}{2} = 32\frac{1}{2}$

8. $\frac{14}{9} = 1\frac{5}{9}$

10. $\frac{42}{8} \times \frac{19}{3} = \frac{266}{8} = 33\frac{1}{4}$

11. $\frac{3}{4} \times \frac{20}{1} = 15$

12. $\frac{8}{1} \times \frac{7}{2} = 28$

13. $\frac{10}{3} \times \frac{19}{4} = \frac{95}{6} = 15\frac{5}{6}$

15. $\frac{11}{4} \times \frac{7}{1} = \frac{77}{4} = 19\frac{1}{4}$

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40.
$$\$3.89$$
$$\times 12.7$$
$$2723$$
$$7780$$
$$+28900$$
$$\$49.403$$

42.
$$\$3.75$$
$$\times 4.25$$
$$1875$$
$$7500$$
$$+150000$$
$$\$15.9375$$

Chapter 8

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5.

6.

7.

8.
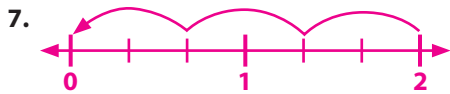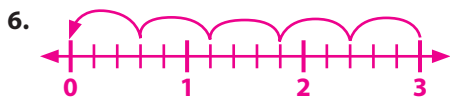
page 173

25. $(3 + \frac{1}{2}) \times \frac{5}{12} = (3 \times \frac{5}{12}) + (\frac{1}{2} \times \frac{5}{12}) =$
$\frac{15}{12} + \frac{5}{24} = \frac{30}{24} + \frac{5}{24} = \frac{35}{24} = 1\frac{11}{24}$

32.
33.
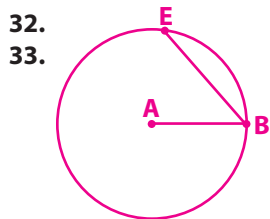
34. $\frac{1}{4} + \frac{2}{3} + \frac{1}{2} + n = 2$
$\frac{3}{12} + \frac{8}{12} + \frac{6}{12} = \frac{17}{12} = 1\frac{5}{12}$
$\frac{24}{12} - \frac{17}{12} = \frac{7}{12}$
or $2 - 1\frac{5}{12} = 1\frac{12}{12} - 1\frac{5}{12} = \frac{7}{12}$

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21. $\frac{2}{15} \times 5 = \frac{2}{3}$
$\frac{2}{3} \div 5 = \frac{2}{15}$
$\frac{2}{3} \div \frac{2}{15} = 5$

22. $\frac{3}{4} \times \frac{2}{5} = \frac{3}{10}$
$\frac{3}{10} \div \frac{3}{4} = \frac{2}{5}$
$\frac{3}{10} \div \frac{2}{5} = \frac{3}{4}$

23. $\frac{3}{5} \times \frac{1}{4} = \frac{3}{20}$
$\frac{3}{20} \div \frac{3}{5} = \frac{1}{4}$
$\frac{3}{20} \div \frac{1}{4} = \frac{3}{5}$

28.

$3 \div \frac{1}{8} = 24$

31. $(\frac{3}{8} + \frac{5}{8}) + (\frac{1}{2} + \frac{5}{6}) + \frac{4}{9} = \frac{8}{8} + (\frac{3}{6} + \frac{5}{6}) + \frac{4}{9} = 1 +$
$\frac{8}{6} + \frac{4}{9} = 1 + \frac{24}{18} + \frac{8}{18} = 1 + \frac{32}{18} = 1 + 1\frac{14}{18} = 2\frac{7}{9}$

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31. $\frac{13}{7} \times \frac{14}{5} = \frac{26}{5} = 5\frac{1}{5}$
$\frac{8}{1} \times \frac{5}{14} = \frac{20}{7} = 2\frac{6}{7}$

32. $\frac{4}{3} \times \frac{1}{3} = \frac{4}{9}$
$\frac{8}{9} \times \frac{3}{1} = \frac{8}{3} = 2\frac{2}{3}$

33. $\frac{11}{5} \times \frac{5}{4} = \frac{11}{4} = 2\frac{3}{4}$
$\frac{21}{8} \times \frac{4}{5} = \frac{21}{10} = 2\frac{1}{10}$

39.

acute   **obtuse**   **right**

40.
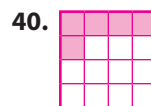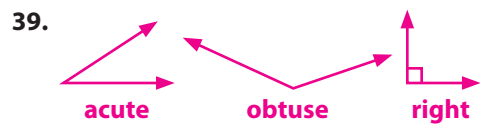
41.
$$92\frac{32}{42} = 92\frac{16}{21}$$
$$42\overline{)3896}$$
$$\underline{-378}$$
$$116$$
$$\underline{-\ 84}$$
$$32$$

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1. $75 - (\frac{1}{5} \times 75) = 75 - \frac{75}{5} = 75 - 15 = 60$
$60 - (\frac{1}{3} \times 60) = 60 - \frac{60}{3} = 60 - 20 =$
40 bags of apples

2. $(2\frac{1}{2} \times 1\frac{1}{2}) + 4 = (\frac{5}{2} \times \frac{3}{2}) + 4 =$
$\frac{15}{4} + 4 = 3\frac{3}{4} + 4 = 7\frac{3}{4}$ **bushels**

3. $8\frac{7}{8} \div 2\frac{1}{4} = \frac{71}{8} \div \frac{9}{4} = \frac{71}{8} \times \frac{4}{9} = \frac{71}{18} = 3\frac{17}{18};$
3 shelves can be made from 1 board;
6 shelves can be made from 2 boards

4. $1\frac{3}{4} + 2\frac{1}{2} = 1\frac{3}{4} + 2\frac{2}{4} = 3\frac{5}{4} = 4\frac{1}{4}$ **hr**

5. $\frac{1}{2} + \frac{3}{4} + 2\frac{7}{8} = \frac{4}{8} + \frac{6}{8} + 2\frac{7}{8} = 2\frac{17}{8} = 4\frac{1}{8}$ **pounds**

6. $(2\frac{1}{2} + 4\frac{1}{4}) \div 3 = (2\frac{2}{4} + 4\frac{1}{4}) \div 3 =$
$6\frac{3}{4} \div 3 = \frac{27}{4} \div 3 = \frac{27}{4} \times \frac{1}{3} = \frac{9}{4} = 2\frac{1}{4}$ **pounds**

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Math 6, Solutions

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7. $10\frac{1}{3} \div \frac{2}{3} = \frac{31}{3} \div \frac{2}{3} = \frac{31}{2} = 15\frac{1}{2}$ red roses;

$2\frac{2}{3} \div \frac{2}{3} = \frac{8}{3} \div \frac{2}{3} = 4$ peach roses;

$15 + 4 = 19$ ribbons

8. $5\frac{1}{4} \div 2 = \frac{21}{4} \div \frac{2}{1} = \frac{21}{4} \times \frac{1}{2} = \frac{21}{8} =$

$2\frac{5}{8}$ pounds of chicken; $6\frac{1}{2} \div 2 =$

$\frac{13}{2} \div \frac{2}{1} = \frac{13}{2} \times \frac{1}{2} = \frac{13}{4} = 3\frac{1}{4}$ pounds of ham

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10. $\frac{2}{3} \times \frac{1}{4} \times \frac{1}{2} = \frac{2}{24} = \frac{1}{12}$

11. $\frac{1}{4} \times \frac{4}{9} + \frac{5}{9} = \frac{1}{9} + \frac{5}{9} = \frac{6}{9} = \frac{2}{3}$

12. $5 + (\frac{1}{4} \times \frac{1}{5}) - \frac{1}{4} = 5 + \frac{1}{20} - \frac{1}{4} =$

$5\frac{1}{20} - \frac{5}{20} = 4\frac{21}{20} - \frac{5}{20} = 4\frac{16}{20} = 4\frac{4}{5}$

13. $\frac{7}{8} \div \frac{1}{4} + \frac{3}{4} = \frac{7}{8} \times \frac{4}{1} + \frac{3}{4} = \frac{7}{2} + \frac{3}{4} =$

$\frac{14}{4} + \frac{3}{4} = \frac{17}{4} = 4\frac{1}{4}$

14. $4 - (\frac{3}{4} \div \frac{1}{4}) \times \frac{1}{2} = 4 - 3 \times \frac{1}{2} = 4 - \frac{3}{2} =$

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

15. $(\frac{1}{4} + \frac{1}{5}) \times (\frac{3}{4} - \frac{1}{4}) = (\frac{5}{20} + \frac{4}{20}) \times \frac{2}{4} =$

$\frac{9}{20} \times \frac{2}{4} = \frac{9}{40}$

16. $\frac{2}{3} + \frac{3}{8} = \frac{16}{24} + \frac{9}{24} = \frac{25}{24} = 1\frac{1}{24}$

17. $5 - \frac{3}{8} = 4\frac{8}{8} - \frac{3}{8} = 4\frac{5}{8}$

18. $\frac{1}{4} + \frac{1}{4} \times \frac{8}{1} = \frac{1}{4} + 2 = 2\frac{1}{4}$

19. $(\frac{5}{15} + \frac{3}{15}) \div (\frac{5}{8} - \frac{2}{8}) = \frac{8}{15} \div \frac{3}{8} = \frac{8}{15} \times \frac{8}{3}$

$= \frac{64}{45} = 1\frac{19}{45}$

20. $(\frac{3}{24} + \frac{16}{24}) \times (\frac{2}{4} - \frac{1}{4}) = \frac{19}{24} \times \frac{1}{4} = \frac{19}{96}$

21. $\frac{5}{2} \div (\frac{5}{6} - \frac{2}{6}) + 1 = \frac{5}{2} \div \frac{3}{6} + 1 = \frac{5}{2} \times \frac{6}{3} +$

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

22. $2\frac{3}{4} \div (\frac{6}{8} - \frac{2}{8}) + 1\frac{1}{2} = 2\frac{3}{4} \div \frac{4}{8} + 1\frac{1}{2} =$

$\frac{11}{4} \times \frac{8}{4} + 1\frac{1}{2} = \frac{22}{4} + 1\frac{1}{2} = 5\frac{1}{2} + 1\frac{1}{2} =$

$6\frac{2}{2} = 7$

23. $\frac{3}{2} \div (\frac{2}{6} + \frac{5}{6}) + 2 = \frac{3}{2} \times \frac{6}{7} + 2 = \frac{9}{7} + 2 =$

$2\frac{9}{7} = 3\frac{2}{7}$

24. $\frac{1}{5} + \frac{4}{9} \times \frac{8}{5} = \frac{1}{5} + \frac{32}{45} = \frac{9}{45} + \frac{32}{45} = \frac{41}{45}$

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9.
```
   328
3)984
  −9
   08
 − 6
   24
  −24
    0
```

10.
```
    328
 ×  1.5
   1640
 +3280
  492.0
```

20.
```
       11 11/14
14)165
    −14
     25
    −14
     11
```

Chapter 9

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1.
```
   3.25            3.25
3)9.75           ×    3
  −9             9.75
   07
 − 6
   15
 − 15
    0
```

2.
```
   69.9           69.9
7)489.3          ×    7
  −42            489.3
   69
  −63
    63
   −63
     0
```

3.
```
   11.78          11.78
6)70.68          ×    6
  −6             70.68
   10
 − 6
   46
  −42
    48
   −48
     0
```

4.
```
   40.9           40.9
5)204.5          ×    5
  −20            204.5
   045
 − 45
    0
```

5.
```
   39.4
6)236.4
  −18
   56
  −54
    24
   −24
     0
```

6.
```
   7.42
3)22.26
  −21
   12
  −12
    06
  − 6
    0
```

7.
```
   46.7
5)233.5
  −20
   33
  −30
    35
   −35
     0
```

8.
```
   4.105
4)16.420
  −16
   04
 − 4
   020
 − 20
    0
```

9.
```
   76.25
6)457.50
  −42
   37
  −36
    15
   −12
     30
    −30
      0
```

10.
```
   4.864
5)24.320
  −20
   43
  −40
    32
   −30
     20
    −20
      0
```

11.
```
      138.69
   3)416.07
    −3
     11
    − 9
      26
     −24
      20
     −18
       27
      −27
        0
```

12.
```
       38.05
   4)152.20
    −12
      32
     −32
       020
      − 20
         0
```

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32.
```
       $2.995  ≈ $3.00
   10)$29.950
    −20
      99
     −90
       95
      −90
        50
       −50
         0
```

33.
```
       2.31  ≈ 2.3 inches
    9)20.80
     −18
       28
      −27
        10
       − 9
         1
```

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5.
```
      1.23              1.23
   9)11.07           ×     9
    − 9              11.07
      20
     −18
       27
      −27
        0
```

6.
```
      0.309            0.309
   5)1.545          ×      5
    −15              1.545
      045
     − 45
        0
```

7.
```
      0.66             0.66
   3)1.98           ×     3
    −18              1.98
      18
     −18
        0
```

8.
```
      5.5              5.5
  12)66.0           ×  12
    −60              110
      60            +550
     −60             66.0 = 66
        0
```

9.
```
      0.459
  49)22.491
    −196
      289
     −245
       441
      −441
         0
```

10.
```
      0.375
   8)3.000
    −24
      60
     −56
       40
      −40
        0
```

11.
```
      0.066
  68)4.488
    −408
      408
     −408
        0
```

12.
```
      7.67
  12)92.04
    −84
      80
     −72
       84
      −84
        0
```

13.
```
      0.16
  50)8.00
    −50
      300
     −300
        0
```

14.
```
      11.63
   2)23.26
    −2
     03
    − 2
      12
     −12
       06
      − 6
        0
```

15.
```
      0.83
  18)14.94
    −144
       54
      −54
        0
```

16.
```
      3.17
  14)44.38
    −42
      23
     −14
       98
      −98
        0
```

17.
```
      26.4
  12)316.8
    −24
      76
     −72
       48
      −48
        0
```

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38.
```
      0.655
   8)5.240
    −48
      44
     −40
       40
      −40
        0
```

39.
```
         56
    ×   3.9
       504
   + 1680
     218.4
```

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1.
```
      3.26̄
  15)49.000
    −45
      40
     −30
       100
     − 90
       100
```

2.
```
       8.416̄
  12)101.0000
    − 96
       50
      −48
        20
       −12
         80
        −72
          80
```

3.
```
      3.3̄
  24)80.00
    −72
      80
     −72
       80
```

4.
```
      8.3̄
   6)50.00
    −48
      20
     −18
       20
```

5.

```
        2.083̅
   12) 25.0000
      −24
        100
      −  96
         40
        −36
         40
```

6.

```
       4.4̅1̅
   9) 39.700
     −36
       37
      −36
       10
      − 9
       10
```

7.

```
       5.96̅
   3) 17.900
     −15
       29
      −27
        20
       −18
        20
```

8.

```
        0.3659̅0̅
   11) 4.025000
      −33
        72
       −66
         65
        −55
         100
        − 99
          100
```

9.

```
        4.6071 ≈ 4.607
   14) 64.5000
      −56
        85
       −84
         100
        − 98
          20
         −14
           6
```

10.

```
       1.8375 ≈ 1.838
   8) 14.7000
     − 8
       67
      −64
        30
       −24
         60
        −56
          40
         −40
           0
```

11.

```
        1.9565 ≈ 1.957
   23) 45.0000
      −23
       220
      −207
        130
       −115
         150
        −138
          120
         −115
            5
```

12.

```
        1.9285 ≈ 1.929
   14) 27.0000
      −14
       130
      −126
         40
        −28
         120
        −112
           80
          −70
           10
```

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13.

```
       5.04
   2) 10.08
     −10
       008
      −008
         0
```

14.

```
       2.375
   2) 4.750
     −4
      07
     − 6
      15
     −14
      10
     −10
       0
```

16.

```
         $137.52
   12) $1,650.24
       −12
         45
        −36
          90
         −84
          62
         −60
          24
         −24
           0
```

17.

```
        0.714285̅
   7) 5.0000000
     −49
       10
      − 7
       30
      −28
        20
       −14
        60
       −56
        40
       −35
        50
```

18.

```
       4.68              4.68
   21) 98.28           ×    21
      −84                 468
       142             + 9360
      −126              98.28
       168
      −168
         0
```

19.

```
        0.362            0.362
   48) 17.376          ×     48
      −144              2896
       297            + 14480
      −288             17.376
         96
        −96
          0
```

20.

```
        2.67            2.67
   39) 104.13         ×    39
      − 78            2403
       261          + 8010
      −234           104.13
       273
      −273
         0
```

21.

```
        6.3̅6̅
   55) 350.000
      −330
        200
       −165
         350
        −330
          200
```

22.

```
        5.5982 ≈ 5.598
   17) 95.17000
      −85
       101
      − 85
       167
      −153
        140
       −136
         40
        −34
         60
```

23.
```
      4.4̄1̄
9)39.700
 −36
  37
 −36
  10
 − 9
  10
```

24.
```
      0.65
20)13.00
  −120
   100
  −100
     0
```

20.
```
   0.2857 ≈ 0.286
7)2.0000
 −14
  60
 −56
  40
 −35
  50
 −49
   1
```

21.
```
   0.6
5)3.0
 −30
   0
```

33.
```
   101 1/4
4)405
 −4
  005
 −  4
     1
```

34.
```
      9.57
18)172.26
  −162
   102
 −  90
   126
  −126
     0
```

22.
```
   0.73̄
15)11.000
  −105
    50
  − 45
    50
```

23.
```
   0.583̄
12)7.0000
  −60
  100
 − 96
   40
  −36
   40
```

24.
```
   0.72
25)18.00
  −175
    50
  − 50
     0
```

35.
```
   0.625
8)5.000
 −48
  20
 −16
  40
 −40
   0
```

36.
```
    6 3/21 = 6 1/7
21)129
  −126
     3
```

37. (2 • 2 • 2) • (3 • 3) • (10 • 10 • 10 • 10) =
8 × 9 × 10,000 =
72 × 10,000 = 720,000

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13.
```
   0.83̄
6)5.000
 −48
  20
 −18
  20
```

14.
```
   0.26̄
15)4.000
  −30
   100
 − 90
   100
```

15.
```
   0.63̄
11)7.000
  −66
   40
  −33
   70
```

16.
```
   0.525
40)21.000
  −200
   100
 − 80
   200
  −200
     0
```

17.
```
   0.375
8)3.000
 −24
  60
 −56
  40
 −40
   0
```

18.
```
   0.1578 ≈ 0.158
19)3.0000
  −19
   110
 − 95
   150
  −133
   170
  −152
    18
```

19.
```
   0.5̄
9)5.00
 −45
  50
```

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25.
```
   0.3̄
3)1.00
 − 9
  10
```

26.
```
   0.6̄
3)2.0
 −18
   2
```

27.
```
   0.5
2)1.0
 −10
   0
```

28.
```
   0.25
4)1.00
 − 8
  20
 −20
   0
```

29.
```
   0.75
4)3.00
 −28
  20
 −20
   0
```

35.
```
   0.95
20)19.00
  −180
   100
  −100
     0
```
```
   0.95
×   20
19.00 = 19
```

36.
```
   58.86
5)294.30
 −25
  44
 −40
  43
 −40
  30
 −30
   0
```
```
   58.86
×     5
294.30 = 294.3
```

37.
```
   1.5
2)3.0
 −2
  10
 −10
   0
```
```
   1.5
× 2
3.0 = 3
```

38.
```
   0.797
34)27.098
  −238
   329
  −306
   238
  −238
     0
```
```
   0.797
×     34
    3188
+ 23910
  27.098
```

44.
$$\begin{array}{r} 583 \\ \times\ 21 \\ \hline 583 \\ +11660 \\ \hline 12{,}243 \end{array}$$

45.
$$\begin{array}{r} 37.84 \\ \times\quad 8 \\ \hline 302.72 \end{array}$$

J
```
          3.142 ≈ 3.14
      7)22.000
        −21
          10
        − 7
          30
         −28
          20
         −14
           6
```

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1.
```
        30
  0.3ʌ)90ʌ
     −9
      00
```

2.
```
          500
  0.15ʌ)7500ʌ
       −75
        000
```

3.
```
         25
  1.2ʌ)300ʌ
     −24
       60
      −60
        0
```

4.
```
          5.625
  1.6ʌ)90ʌ000
      −80
       100
      − 96
         40
        −32
         80
        −80
          0
```

5.
```
         32
  0.5ʌ)160ʌ
     −15
       10
      −10
        0
```

6.
```
          2.2857 ≈ 2.286
  3.5ʌ)80ʌ0000
      −70
       100
      − 70
        300
       −280
        200
       −175
        250
       −245
          5
```

7.
```
           18.5714 ≈ 18.571
  0.7ʌ)130ʌ0000
      − 7
        60
       −56
         40
        −35
          50
         −49
           10
         −  7
            30
          −28
            2
```

8.
```
           200
  0.32ʌ)6400ʌ
       −64
        000
```

9.
```
           0.9677 ≈ 0.968
  6.2ʌ)60ʌ0000
      −558
        420
       −372
         480
        −434
          460
         −434
           26
```

10.
```
         7.5
  0.4ʌ)30ʌ0
      −28
        20
       −20
         0
```

11.
```
           88.8̄
  0.09ʌ)800ʌ00
       −72
         80
        −72
          80
         −72
           80
```

12.
```
          6
  2.5ʌ)150ʌ
      −150
         0
```

13.
```
         25
  3.2ʌ)80ʌ0
      −64
       160
      −160
         0
```

14.
```
          780
  0.05ʌ)3900ʌ
       −35
         40
        −40
          00
```

15.
```
             8.0614 ≈ 8.061
  5.21ʌ)4200ʌ0000
       −4168
         3200
        −3126
          740
         −521
          2190
         −2084
           106
```

16.
```
          40
  12.4ʌ)4960ʌ
       −496
         00
```

17.
```
           33.3̄
  0.12ʌ)400ʌ00
       −36
         40
        −36
          40
         −36
           40
```

18.
```
         12
  3.5ʌ)420ʌ
     −35
       70
      −70
        0
```

19.
```
          26.6̄
  0.3ʌ)80ʌ00
     −6
       20
      −18
        20
       −18
         20
```

20.
```
          920
  0.3ʌ)2760ʌ
     −27
       06
      − 6
        00
```

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21.
```
        20
0.4⟍)80⟍
      −80
        0
```
20 pieces of rope can be cut; 28 pieces are needed.

```
    28
  ×0.4
  11.2
```
no, 11.2 meters of rope would be needed.

23.
```
    0.75
4)3.00
  −28
    20
  −20
     0
```
```
    1.5
2)3.0
  −2
   10
  −10
    0
```
```
       2.125
8)17.000
  −16
    10
   −8
    20
   −16
     40
    −40
      0
```

```
    0.75
    1.5
  +2.125
   4.375
```
```
    1.458 ≈ 1.46
3)4.375
  −3
   13
  −12
    17
   −15
    25
   −24
     1
```

25.
```
       2.2575
16)36.1200
   −32
    41
   −32
     92
    −80
     120
    −112
      80
     −80
       0
```

26.
```
         10.7692 ≈ 10.769
3.9⟍)420⟍0000
    −39
     300
    −273
     270
    −234
      360
     −351
       90
      −78
       12
```

27.
```
         695
0.4⟍)2780⟍
    −24
     38
    −36
     20
    −20
      0
```

29.
```
    0.6
5)3.0
  −30
    0
```

37.
```
      562.3̄
3)1,687.00
  −15
   18
  −18
    07
   −6
    10
    −9
     10
```

J
```
    4.85
2)9.70
  −8
   17
  −16
   10
  −10
    0
```
```
    4.6
5)23.0
  −20
   30
  −30
    0
```
```
    0.9
10)9.0
  −90
    0
```

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1.
```
    0.2
15)3.0
  −30
    0
```

2.
```
     $6.25
12)$75.00
  −72
    30
  −24
    60
  −60
    0
```

3.
```
        2.13̄
3.6⟍)7.6⟍800
    −72
     48
    −36
     120
    −108
      120
```

4.
```
       9
0.3⟍)2.7⟍
    −27
      0
```

5.
```
     3.425
8)27.400
  −24
   34
  −32
    20
   −16
    40
   −40
     0
```

6.
```
    1.2
5)6.0
  −5
   10
  −10
    0
```

7.
```
    $0.19
5)$0.95
  −5
   45
  −45
    0
```

8.
```
       6.2
1.1⟍)6.8⟍2
    −66
     22
    −22
      0
```

9.
```
          38.6̄
0.24⟍)9.28⟍00
     −72
      208
     −192
       160
      −144
        160
```

10.
```
       0.3
0.6⟍)0.1⟍8
    −18
      0
```

11.
```
        2.125
1.6∧)3.4∧000
   −32
     20
    −16
     40
    −32
      80
     −80
       0
```

12.
```
        4.13̄8̄
1.8∧)7.4∧5000
   −72
     25
    −18
      70
     −54
      160
     −144
      160
```

19.
```
          288.2352 ≈ 288.235
0.17∧)49.00∧0000
    −34
     150
    −136
      140
     −136
        40
       −34
        60
       −51
        90
       −85
        50
       −34
        16
```

13.
```
     0.46          2.1          3.15
4)1.84          4)8.4        4)12.60
  −16              −8            −12
    24               04            06
   −24             − 4           − 4
     0               0             20
                                 −20
                                   0
```

14.
```
      0.7            0.8            0.9
1.5∧)1.0∧5      1.5∧)1.2∧0      1.5∧)1.3∧5
   −105            −120            −135
      0               0               0
```

20.
```
     $4.675 ≈ $4.68
2)$9.350
 −8
  13
 −12
   15
  −14
    10
   −10
     0
```

15.
```
       2.3            2.5              4
4.2∧)9.6∧6      4.2∧)10.5∧0      4.2∧)16.8∧
   −84            − 84            −168
    126            210               0
   −126           −210
      0              0
```

21.
```
     $0.473 ≈ $0.47
8)$3.790
 −32
   59
  −56
    30
   −24
     6
```

16.
```
      0.1347 ≈ 0.135
2.3∧)0.3∧1000
   −23
     80
    −69
     110
   −  92
      180
     −161
       19
```

22.
```
      $0.186 ≈ $0.19
16)$2.980
  −16
   138
  −128
    100
  −  96
       4
```

17.
```
      3.9523 ≈ 3.952
2.1∧)8.3∧0000
   −63
    200
   −189
     110
    −105
       50
      −42
       80
      −63
       17
```

27.
```
        33.333 ≈ 33.33
30)1,000.000
  − 90
    100
  − 90
    100
  − 90
    100
  − 90
    100
  − 90
    100
  − 90
    10
```

18.
```
         0.3337 ≈ 0.334
7.7∧)2.5∧7000
    −231
     260
    −231
      290
     −231
       590
      −539
        51
```

32.
```
        1.216̄
0.6∧)0.7∧3000
    − 6
      13
     −12
       10
      − 6
       40
      −36
       40
```

J
```
      7                7
0.8∧)5.6∧        0.08∧)0.56∧
   −56                 −56
     0                   0
```

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1–12.


```
        RATIONAL
   1/12          −8
          INTEGERS
  4/8    −11      −10
          WHOLE
          NATURAL
0.275    3    92    0.8333
         0
    0.96̄      0.2̄
        IRRATIONAL
        0.354354435444…
```

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28.
```
  $23.95            $14.37
×      3         5)$71.85
  $71.85           −5
                    21
                   −20
                    18
                   −15
                    35
                   −35
                     0
```

29.
```
          14.26̄
0.75∧)10.70∧000
   −   75
       320
      −300
       200
      −150
       500
      −450
       500
```

31.
```
      16 r4 or 16 4/6
6)100
  − 6
    40
   −36
     4
```

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14.
```
    63.23            $0.37
6)379.38         4)$1.48
 −36              − 12
  19                28
 −18               −28
  13                 0
 −12
  18
 −18
   0
```
15.

16.
```
    45               4.3̄
0.2∧)90∧        1.5∧)6.5∧00
   −8               −60
   10                50
  −10               −45
    0                50
```
17.

18.
```
     17.3̄              25
0.3∧)5.2∧00     0.28∧)700∧
   −3                −56
    22               140
   −21              −140
    10                 0
   − 9
    10
```
19.

20.
```
     24               13.16̄
0.5∧)120∧       0.12∧)1.58∧000
   −10              −12
    20               38
   −20              −36
     0               20
                    −12
                     80
                    −72
                     80
```
21.

22.
```
    $0.54             3.65
27)$14.58        14)51.10
  −135             −42
   108              91
  −108             −84
     0              70
                   −70
                     0
```
23.

24.
```
     0.4228 ≈ 0.423
76)32.1400
  −304
   174
  −152
   220
  −152
   680
  −608
    72
```

25.
$$16\overline{)21.5000} = 1.3437 \approx 1.344$$
$$\underline{-16}$$
$$55$$
$$\underline{-48}$$
$$70$$
$$\underline{-64}$$
$$60$$
$$\underline{-48}$$
$$120$$
$$\underline{-112}$$
$$8$$

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26.
$$9\overline{)8.0} = 0.\overline{8}$$
$$\underline{-72}$$
$$8$$

27.
$$10\overline{)7.0} = 0.7$$
$$\underline{-70}$$
$$0$$

28.
$$3\overline{)2.0} = 0.\overline{6}$$
$$\underline{-18}$$
$$2$$

29.
$$6\overline{)5.000} = 0.8\overline{3}$$
$$\underline{-48}$$
$$20$$
$$\underline{-18}$$
$$20$$

39.
$$4\overline{)9.2} = 2.3$$
$$\underline{-8}$$
$$12$$
$$\underline{-12}$$
$$0$$

Chapter 10

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33. 36: 1, 2, 3, 4, 6, 9, 12, 18, 36
72: 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72
GCF = 36

36. The fractions, $\frac{6}{16}$, $\frac{9}{24}$, and $\frac{12}{32}$, are equivalent to $\frac{3}{8}$.

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22. $8x + (4x + 2) =$ **Commutative**
$(8x + 4x) + 2 =$ **Associative**
$12x + 2$

24. $(2 + 3) + x$ **Associative**
$x + 5$

25. $(3 \cdot 7)x$ **Associative**
$21x$

26. $(8 + 2) + x$ **Associative**
$x + 10$

27. $x(8 \cdot 9)$ **Associative**
$72x$ **Commutative**

28. $6 + (5x + 7)$ **Associative**
$6 + (7 + 5x)$ **Commutative**
$(6 + 7) + 5x$ **Associative**
$5x + 13$

29. $x \cdot (5 \cdot 6)$ **Associative**
$30x$ **Commutative**

30. $(12 \cdot 2)x$ **Associative**
$24x$

43.
$$\$27$$
$$\underline{\times \ 45}$$
$$135$$
$$\underline{+1080}$$
$$\$1,215$$

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1. $n + 5 - 5 = 21 - 5$
$n = 16$
$16 + 5 = 21$

2. $x + 12 - 12 = 40 - 12$
$x = 28$
$28 + 12 = 40$

3. $c - 6 + 6 = 17 + 6$
$c = 23$
$23 - 6 = 17$

4. $a - 4 + 4 = 36 + 4$
$a = 40$
$40 - 4 = 36$

5. $d + 45 - 45 = 90 - 45$
$d = 45$
$45 + 45 = 90$

6. $16 - 16 + f = 35 - 16$
$f = 19$
$16 + 19 = 35$

7. $s - 39 + 39 = 61 + 39$
$s = 100$
$100 - 39 = 61$

8. $24 - 24 + n = 100 - 24$
$n = 76$
$24 + 76 = 100$

9. $d + 60 = 85$
$d + 60 - 60 = 85 - 60$
$d = 25$
$25 + 43 + 17 = 85$

10. $s + 11.5 = 20$
$s + 11.5 - 11.5 = 20 - 11.5$
$s = 8.5$
$8.5 + 14 - 3 + 0.5 = 20$

11. $19.8 + b = 29$
$19.8 - 19.8 + b = 29 - 19.8$
$b = 9.2$
$3.8 + 16 + 9.2 = 29$

12. $1\frac{1}{4} + f = 1\frac{1}{2}$
$1\frac{1}{4} - 1\frac{1}{4} + f = 1\frac{1}{2} - 1\frac{1}{4}$
$f = \frac{1}{4}$
$\frac{3}{4} + \frac{1}{2} + \frac{1}{4} = 1\frac{1}{2}$

13. $14 - 8 = 6$; yes

14. $17 + 13 \neq 40$; no
$x + 13 - 13 = 40 - 13$
$x = 27$

15. $2.6 - 17 \neq 9$; no
$f - 17 + 17 = 9 + 17$
$f = 26$

16. $0.8 + 0.8 \neq 1.7$; no
$n + 0.8 - 0.8 = 1.7 - 0.8$
$n = 0.9$

17. $8 - 1\frac{1}{2} = 6\frac{1}{2}$; yes

18. $20.2 + 17 + 3.5 = 40.7$; yes

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28. $n + 5 = 12$
$n + 5 - 5 = 12 - 5$
$n = 7$
$7 + 5 = 12$

29. $n - 8 = 3$
$n - 8 + 8 = 3 + 8$
$n = 11$
$11 - 8 = 3$

30. $10 + n = 17$
$10 - 10 + n = 17 - 10$
$n = 7$
$10 + 7 = 17$

31. $n - 2 = 5$
$n - 2 + 2 = 5 + 2$
$n = 7$
$7 - 2 = 5$

32. $n - 6 = 12$
$n - 6 + 6 = 12 + 6$
$n = 18$
$18 - 6 = 12$

33. $n + 3 = 16$
$n + 3 - 3 = 16 - 3$
$n = 13$
$13 + 3 = 16$

34. $n - 7 = 9$
$n - 7 + 7 = 9 + 7$
$n = 16$
$16 - 7 = 9$

35. $7 + n = 10$
$7 - 7 + n = 10 - 7$
$n = 3$
$7 + 3 = 10$

36.
$$\begin{array}{r} 113 \\ \times\,609 \\ \hline 1017 \\ +\,67800 \\ \hline 68,817 \end{array}$$

42.
$$\begin{array}{r} 17 \\ 3\overline{)51} \\ -3 \\ \hline 21 \\ -21 \\ \hline 0 \end{array}$$

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1. $a \times \frac{5}{5} = \frac{30}{5}$
$a = 6$
$6 \times 5 = 30$

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

3. $f \cdot \frac{3}{3} = \frac{24}{3}$
$f = 8$
$8 \cdot 3 = 24$

4. $\frac{12}{12} \cdot b = \frac{36}{12}$
$b = 3$
$12 \cdot 3 = 36$

5. $\frac{9p}{9} = \frac{54}{9}$
$p = 6$
$9(6) = 54$

6. $\frac{8}{8} \cdot p = \frac{64}{8}$
$p = 8$
$8 \cdot 8 = 64$

7. $\frac{4n}{4} = \frac{32}{4}$
$n = 8$
$4(8) = 32$

8. $\frac{7n}{7} = \frac{56}{7}$
$n = 8$
$7(8) = 56$

9. $c \cdot \frac{7}{7} = \frac{49}{7}$
$c = 7$
$7 \cdot 7 = 49$

10. $d \times 2^2 = 48$
$d \times 4 = 48$
$d \times \frac{4}{4} = \frac{48}{4}$
$d = 12$
$12 \cdot 2^2 = 48$

11. $a \cdot \frac{0.9}{0.9} = \frac{3.6}{0.9}$
$a = 4$
$4 \cdot 0.9 = 3.6$

12. $\frac{1.8}{1.8} \times a = \frac{36}{1.8}$
$a = 20$
$1.8 \times 20 = 36$

13. $a \cdot 7 = 21$ or $7a = 21$

$a \cdot \frac{7}{7} = \frac{21}{7}$

$a = 3$

14. $y \cdot 9 = 54$ or $9y = 54$

$y \cdot \frac{9}{9} = \frac{54}{9}$

$y = 6$

15. $8 \cdot b = 48$ or $8b = 48$

$\frac{8}{8} \cdot b = \frac{48}{8}$

$b = 6$

16. $3 \cdot n = 36$ or $3n = 36$

$\frac{3}{3} \cdot n = \frac{36}{3}$

$n = 12$

17. $x \cdot 7 = 35$ or $7x = 35$

$x \cdot \frac{7}{7} = \frac{35}{7}$

$x = 5$

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24. $8 - 2 = x + 2 - 2$

$6 = x$ or $x = 6$

25. $x - 5 + 5 = 8 + 5$

$x = 13$

26. $b \cdot \frac{8}{8} = \frac{48}{8}$

$b = 6$

27. $\frac{5m}{5} = \frac{40}{5}$

$m = 8$

28. $16 - 9 = 9 - 9 + x$

$7 = x$ or $x = 7$

29. $a - 9 + 9 = 25 + 9$

$a = 34$

30. $a + 9 - 9 = 20 - 9$

$a = 11$

31. $\frac{6n}{6} = \frac{36}{6}$

$n = 6$

32. $\frac{3}{3} \cdot m = \frac{30}{3}$

$m = 10$

33. $b - 3 + 3 = 12 + 3$

$b = 15$

34. $x + 2 - 2 = 25 - 2$

$x = 23$

35. $\frac{24}{4} = \frac{4x}{4}$

$6 = x$ or $x = 6$

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1. $\frac{n}{7} \cdot 7 = 63 \times 7$

$n = 441$

$441 \div 7 = 63$

2. $\frac{3}{3} \cdot x = \frac{15}{3}$

$x = 5$

$3 \cdot 5 = 15$

3. $\frac{2}{3} \div \frac{2}{3} \cdot x = 15 \div \frac{2}{3}$

$x = 15 \cdot \frac{3}{2}$

$x = \frac{45}{2} = 22\frac{1}{2}$

$\frac{2}{3} \cdot \frac{45}{2} = 15$

4. $\frac{1}{2} \div \frac{1}{2} \cdot p = 45 \div \frac{1}{2}$

$p = 45 \times \frac{2}{1}$

$p = 90$

$\frac{1}{2}(90) = 45$

5. $\frac{m}{4} \cdot 4 = 3 \cdot 4$

$m = 12$

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

6. $n \cdot \frac{1}{5} \div \frac{1}{5} = 9 \div \frac{1}{5}$

$n = 9 \times \frac{5}{1}$

$n = 45$

$45 \cdot \frac{1}{5} = 9$

7. $\frac{x}{9} \cdot 9 = 18 \cdot 9$

$x = 162$

$\frac{162}{9} = 18$

8. $\frac{3n}{3} = \frac{78.12}{3}$

$n = 26.04$

$3(26.04) = 78.12$

9. $\frac{x}{8} \cdot 8 = 14.5 \cdot 8$

$x = 116$

$116 \div 8 = 14.5$

10. $\frac{r}{0.3} \cdot 0.3 = 57.5 \cdot 0.3$

$r = 17.25$

$17.25 \div 0.3 = 57.5$

11. $\frac{4}{4} \cdot c = \frac{32}{4}$

$c = 8$

$4 \cdot 8 = 32$

12. $p \cdot \frac{3}{5} \div \frac{3}{5} = 5 \div \frac{3}{5}$

$p = 5 \cdot \frac{5}{3}$

$p = \frac{25}{3} = 8\frac{1}{3}$

$\frac{25}{3} \cdot \frac{3}{5} = 5$

13. $n \div 12 = 3$

$\frac{n}{12} \cdot 12 = 3 \cdot 12$

$n = 36$

$36 \div 12 = 3$

14. $x \cdot 7 = 35$

$x \cdot \frac{7}{7} = \frac{35}{7}$

$x = 5$

$5 \cdot 7 = 35$

15. $n \div 5 = 11$

$\frac{n}{5} \cdot 5 = 11 \cdot 5$

$n = 55$

$55 \div 5 = 11$

16. $6n = 54$

$\frac{6n}{6} = \frac{54}{6}$

$n = 9$

$6(9) = 54$

17. $y \div 7 = 2$

$\frac{y}{7} \cdot 7 = 2 \cdot 7$

$y = 14$

$14 \div 7 = 2$

18. $n \div 20 = 3$

$\frac{n}{20} \cdot 20 = 3 \cdot 20$

$n = 60$

$60 \div 20 = 3$

19. $2n = 18$

$\frac{2n}{2} = \frac{18}{2}$

$n = 9$

$2(9) = 18$

20. $n \cdot 5 = 10$

$n \cdot \frac{5}{5} = \frac{10}{5}$

$n = 2$

$2 \cdot 5 = 10$

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37.
$$\begin{array}{r} 26 \\ \times\,15 \\ \hline 130 \\ +\,260 \\ \hline 390 \end{array}$$

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21. $a + 5 - 5 = 33 - 5$

$a = 28$

$28 + 5 = 33$

22. $x - 1.2 + 1.2 = 10 + 1.2$

$x = 11.2$

$11.2 - 1.2 = 10$

23. $\frac{a}{12} \cdot 12 = 3 \cdot 12$

$a = 36$

$\frac{36}{12} = 3$

24. $\frac{8x}{8} = \frac{1}{8}$

$x = \frac{1}{8}$

$8 \cdot \frac{1}{8} = 1$

25. $n - 16 + 16 = 140 + 16$

$n = 156$

$156 - 16 = 140$

26. $\frac{8x}{8} = \frac{480}{8}$

$x = 60$

$8(60) = 480$

27. $y - 43 + 43 = 129 + 43$

$y = 172$

$172 - 43 = 129$

28. $\frac{3}{4} \div \frac{3}{4} \cdot x = 6 \div \frac{3}{4}$

$x = 6 \cdot \frac{4}{3}$

$x = \frac{24}{3} = 8$

$\frac{3}{4}(8) = \frac{24}{4} = 6$

29. $\frac{2x}{2} = \frac{14.8}{2}$

$x = 7.4$

$2(7.4) = 14.8$

30. $x - 6 + 6 = 1.4 + 6$

$x = 7.4$

$7.4 - 6 = 1.4$

31. $\frac{1.5w}{1.5} = \frac{30}{1.5}$

$w = 20$

$1.5(20) = 30$

32. $\frac{3.8}{3.8}p = \frac{64.6}{3.8}$

$p = 17$

$3.8 \times 17 = 64.6$

33. $\frac{x}{9} \cdot 9 = 4 \cdot 9$

$x = 36$

$\frac{36}{9} = 4$

34. $a + 1.7 - 1.7 = 1.9 - 1.7$
$a = 0.2$
$0.2 + 1.7 = 1.9$

35. $\frac{x}{12} \cdot 12 = 62 \cdot 12$
$x = 744$
$\frac{744}{12} = 62$

39. $p \cdot 8 = 200$
$p \cdot \frac{8}{8} = \frac{200}{8}$
$p = 25$

40. $i + 9 = 20$
$i + 9 - 9 = 20 - 9$
$i = 11$

44. $\frac{1}{2}n = 118$
$\frac{1}{2}n \div \frac{1}{2} = 118 \div \frac{1}{2}$
$n = 118 \cdot \frac{2}{1}$
$n = 236$

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1. $d = r \cdot t$
$11247 = r \cdot 102$
$\frac{11247}{102} = r\frac{102}{102}$
$r \approx 110$ **kilometers per hour**

2. $d = r \cdot t$
$96 = r \cdot 4$
$\frac{96}{4} = r \cdot \frac{4}{4}$
$r = 24$ **miles per day**

3. $d = r \cdot t$
$d = 93 \cdot 52$
$d = 4836$ **kilometers**

4. $d = r \cdot t$
$380 = 95 \cdot t$
$\frac{380}{95} = \frac{95}{95} \cdot t$
$t = 4$ **hours**

5. $d = r \cdot t$
$d = 85 \cdot 4$
$d = 340$ **kilometers**

6. $d = r \cdot t$
$33 = 11 \cdot t$
$\frac{33}{11} = \frac{11}{11} \cdot t$
$t = 3$ **hours**

7. $d = r \cdot t$
$d = 22 \cdot 15$
$d = 330$ **yards**

8. $d = r \cdot t$
$1760 = 22 \cdot t$
$\frac{1760}{22} = \frac{22}{22} \cdot t$
$t = 80$ **minutes**

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34. $\frac{x}{4} \cdot 4 = 9 \cdot 4$
$x = 36$
$\frac{36}{4} = 9$

35. $n - 8 + 8 = 61 + 8$
$n = 69$
$69 - 8 = 61$

36. $\frac{4a}{4} = \frac{56}{4}$
$a = 14$
$4 \cdot 14 = 56$

37. $n + 3 - 3 = 32 - 3$
$n = 29$
$29 + 3 = 32$

38. $x - 1.6 + 1.6 = 1.4 + 1.6$
$x = 3$
$3 - 1.6 = 1.4$

39. $\frac{y}{5} \cdot 5 = 25 \cdot 5$
$y = 125$
$125 \div 5 = 25$

40. $b + 5 - 5 = 48 - 5$
$b = 43$
$43 + 5 = 48$

41. $\frac{7n}{7} = \frac{85.4}{7}$
$n = 12.2$
$7 \cdot 12.2 = 85.4$

Chapter 11

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12. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 27 \text{ mm}) + (2 \cdot 6.5 \text{ mm})$
$P = 54 \text{ mm} + 13 \text{ mm}$
$P = 67 \text{ mm}$

13. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 46 \text{ m}) + (2 \cdot 29 \text{ m})$
$P = 92 \text{ m} + 58 \text{ m}$
$P = 150 \text{ m}$

14. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 42 \text{ cm}) + (2 \cdot 8.5 \text{ cm})$
$P = 84 \text{ cm} + 17 \text{ cm}$
$P = 101 \text{ cm}$

15. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 12\text{ m}) + (2 \cdot 15\text{ m})$
$P = 24\text{ m} + 30\text{ m}$
$P = 54\text{ m}$

16. $12\text{ m} = (3\text{ m} + 4\text{ m}) + n$
$12\text{ m} = 7\text{ m} + n$
$12\text{ m} - 7\text{ m} = 7\text{ m} - 7\text{ m} + n$
$n = 5\text{ m}$

17. $24\text{ yd} = (2 \cdot 4\text{ yd}) + 6\text{ yd} + 8\text{ yd} + n$
$24\text{ yd} = 8\text{ yd} + 6\text{ yd} + 8\text{ yd} + n$
$24\text{ yd} = 22\text{ yd} + n$
$24\text{ yd} - 22\text{ yd} = 22\text{ yd} - 22\text{ yd} + n$
$n = 2\text{ yd}$

18. $P = (2 \cdot l) + (2 \cdot w)$
$P = 2(2 \cdot 4\text{cm}) + (2 \cdot 4\text{ cm})$
$P = 2(8\text{ cm}) + 8\text{ cm}$
$P = 16\text{ cm} + 8\text{ cm}$
$P = 24\text{ cm}$

19. $P = (2 \cdot l) + (2 \cdot w)$
$P = 2(4\text{ cm} + 3\text{ cm}) + (2 \cdot 4\text{ cm})$
$P = 2(7\text{cm}) + 8\text{ cm}$
$P = 14\text{ cm} + 8\text{ cm}$
$P = 22\text{ cm}$

22. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 100\text{ yd}) + (2 \cdot 50\text{ yd})$
$P = 200\text{ yd} + 100\text{ yd}$
$P = 300\text{ yd}$

23. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 50\text{ yd}) + (2 \cdot 20\text{ yd})$
$P = 100\text{ yd} + 40\text{ yd}$
$P = 140\text{ yd}$

24. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 50\text{ yd}) + (2 \cdot 55\text{ yd})$
$P = 100\text{ yd} + 110\text{ yd}$
$P = 210\text{ yd}$

25. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 40\text{ yd}) + (2 \cdot 50\text{ yd})$
$P = 80\text{ yd} + 100\text{ yd}$
$P = 180\text{ yd}$

26. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 200\text{ yd}) + (2 \cdot 75\text{ yd})$
$P = 400\text{ yd} + 150\text{ yd}$
$P = 550\text{ yd}$

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9. $C = \pi d$
$C = 3.14 \cdot 8\text{ yd}$
$C = 25.12\text{ yd}$

10. $C = \pi d$
$C = 3.14 \cdot 3.5\text{ m}$
$C = 10.99\text{ m}$

11. $C = 2\pi r$
$C = 2 \cdot 3.14 \cdot 2.7\text{ cm}$
$C = 16.956\text{ cm} \approx 16.96\text{ cm}$

12. $C = \pi d$
$C = 3.14 \cdot 1\frac{3}{4}\text{ ft}$
$C = 3.14 \cdot 1.75\text{ ft}$
$C = 5.495\text{ ft} \approx 5.50\text{ ft or } 5.5\text{ ft}$

13. $C = 2\pi r$
$C = 2 \cdot 3.14 \cdot 13\text{ m}$
$C = 81.64\text{ m}$

14. $P = 6 \cdot 4\text{ ft}$
$P = 24\text{ ft}$

15. $P = (2 \cdot 6\text{ cm}) + (2 \cdot 2\text{ cm})$
$P = 12\text{ cm} + 4\text{ cm}$
$P = 16\text{ cm}$

16. $P = (2 \cdot 20\text{ m}) + (2 \cdot 15\text{ m}) + 25\text{ m} + 30\text{ m}$
$P = 40\text{ m} + 30\text{ m} + 25\text{ m} + 30\text{ m}$
$P = 125\text{ m}$

19. $C = 2\pi r$
$C = 2 \cdot 3.14 \cdot 4\text{ ft}$
$C = 25.12\text{ ft}$

20. $C = \pi d$
$C = 3.14 \cdot 60\text{ in.}$
$C = 188.4\text{ in.}$

21. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 10) + (2 \cdot 5)$
$P = 20 + 10$
$P = 30\text{ ft}$
$30 \cdot \$4.50 = \$135.00$

22. $C = \pi d$
$C = 3.14 \cdot 212\text{ ft}$
$C = 665.68\text{ ft}$

23. $C = \pi d$
$C = 3.14 \cdot 20\text{ in.}$
$C = 62.8\text{ in.}$

24. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 12) + (2 \cdot 8)$
$P = 24 + 16$
$P = 40\text{ ft}$
$40 \div 15 = 2.\overline{6}$; 3 rolls

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5. $A = b \cdot h$
$A = 2.3\text{ m} \cdot 2.7\text{ m}$
$A = 6.21\text{ m}^2$

6. $A = b \cdot h$
$A = 5 \text{ in.} \cdot 12 \text{ in.}$
$A = 60 \text{ in.}^2$

7. $A = l \cdot w$
$A = (10 \text{ yd} \cdot 12 \text{ yd}) + (18 \text{ yd} \cdot 20 \text{ yd})$
$A = 120 \text{ yd}^2 + 360 \text{ yd}^2$
$A = 480 \text{ yd}^2$

8. $A = l \cdot w$
$A = (2 \text{ cm} \cdot 2 \text{ cm}) + (2 \text{ cm} \cdot 1 \text{ cm}) + (1 \text{cm} \cdot 1 \text{cm})$
$A = 4 \text{ cm}^2 + 2 \text{ cm}^2 + 1 \text{ cm}^2$
$A = 7 \text{ cm}^2$

9. $n = A \div s$
$n = 25 \text{ ft}^2 \div 5 \text{ ft}$
$n = 5 \text{ ft}$

10. $n = A \div s$
$n = 136 \text{ yd}^2 \div 17 \text{ yd}$
$n = 8 \text{ yd}$

11. $n = A \div s$
$n = 70 \text{ m}^2 \div 5.6 \text{ m}$
$n = 12.5 \text{ m}$

12. $n = A \div s$
$n = 140 \text{ cm}^2 \div 10 \text{ cm}$
$n = 14 \text{ cm}$

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13. $A = l \cdot w$
$A = 35 \text{ cm} \cdot 15 \text{ cm}$
$A = 525 \text{ cm}^2$

14. $A = b \cdot h$
$A = 5 \text{ m} \cdot 4 \text{ m}$
$A = 20 \text{ m}^2$

15. $A = s^2 \text{ or } A = l \cdot w$
$A = (1.9 \text{ yd})^2 \text{ or } A = 1.9 \text{ yd} \cdot 1.9 \text{ yd}$
$A = 3.61 \text{ yd}^2$

16. $A = b \cdot h$
$A = 18 \text{ ft} \cdot 10 \text{ ft}$
$A = 180 \text{ ft}^2$

17. $A = s^2 \text{ or } A = l \cdot w$

$A = \left(3\frac{1}{2} \text{ in.}\right)^2 \text{ or } A = 3\frac{1}{2} \text{ in.} \cdot 3\frac{1}{2} \text{ in.}$

$A = \left(\frac{7}{2} \text{ in.}\right)^2 \text{ or } A = \frac{7}{2} \text{ in.} \cdot \frac{7}{2} \text{ in.}$

$A = \frac{49}{4} \text{ in.}^2 = 12\frac{1}{4} \text{ in.}^2$

18. $A = l \cdot w$
$A = 4 \text{ m} \cdot 3.2 \text{ m}$
$A = 12.8 \text{ m}^2$

19. $A = l \cdot w$
$A = (10 \text{ cm} \cdot 6 \text{ cm}) + (5 \text{ cm} \cdot 5 \text{ cm})$
$A = 60 \text{ cm}^2 + 25 \text{ cm}^2$
$A = 85 \text{ cm}^2$

⃝20 $A = l \cdot w$
$A = 2(3 \text{ m} \cdot 3 \text{ m}) + (13 \text{ m} \cdot 6 \text{ m})$
$A = 18 \text{ m}^2 + 78 \text{ m}^2$
$A = 96 \text{ m}^2$

21. $A = l \cdot w$
$A = 4 \text{ in.} \cdot 8 \text{ in.}$
$A = 32 \text{ in.}^2$

22. $A = b \cdot h$
$A = 15 \text{ ft} \cdot 24 \text{ ft}$
$A = 360 \text{ ft}^2$

23. $A = b \cdot h$
$A = 4.5 \text{ m} \cdot 7.5 \text{ m}$
$A = 33.75 \text{ m}^2$

24. $n = A \div s$
$n = 84 \text{ yd}^2 \div 7 \text{ yd}$
$n = 12 \text{ yd}$

25. $n = A \div s$
$n = 49.5 \text{ m}^2 \div 5.5 \text{ m}$
$n = 9 \text{ m}$

26. $n = A \div s$
$n = 100 \text{ ft}^2 \div 10 \text{ ft}$
$n = 10 \text{ ft}$

29. $A = l \cdot w$
$A = (75 \text{ ft} \cdot 50 \text{ ft}) - 450 \text{ ft}^2$
$A = 3{,}750 \text{ ft}^2 - 450 \text{ ft}^2$
$A = 3{,}300 \text{ ft}^2$

30. $C = \pi d$
$C = 2 \cdot (3.14 \cdot 3 \text{ ft})$
$C = 2 \cdot 9.42 \text{ ft}$
$C = 18.84 \text{ ft}$

31. $P = n \cdot s$
$P = 8 \cdot 12 \text{ in.}$
$P = 96 \text{ in.}$

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1. $A = b \cdot h$
$A = 8 \text{ m} \cdot 6 \text{ m}$
$A = 48 \text{ m}^2$

2. $A = \frac{1}{2}(b \cdot h)$
$A = \frac{1}{2}(8 \text{ m} \cdot 6 \text{ m})$
$A = \frac{1}{2}(48 \text{ m}^2)$
$A = 24 \text{ m}^2$

3. $A = b \cdot h$
$A = 7 \text{ in.} \cdot 5 \text{ in.}$
$A = 35 \text{ in.}^2$

4. $A = \frac{1}{2}(b \cdot h)$
$A = \frac{1}{2}(7 \text{ in.} \cdot 5 \text{ in.})$
$A = \frac{1}{2}(35 \text{ in.}^2)$
$A = 17.5 \text{ in.}^2$

5. $A = \frac{1}{2}(b \cdot h)$
$A = \frac{1}{2}(5 \text{ in.} \cdot 3 \text{ in.})$
$A = \frac{1}{2}(15 \text{ in.}^2)$
$A = 7.5 \text{ in.}^2$

6. $A = \frac{1}{2}(b \cdot h)$
$A = \frac{1}{2}(2.5 \text{ cm} \cdot 2.5 \text{ cm})$
$A = \frac{1}{2}(6.25 \text{ cm}^2)$
$A = 3.125 \text{ cm}^2$

7. $A = \frac{1}{2}(b \cdot h)$
$A = \frac{1}{2}(1\frac{1}{4} \text{ in.} \cdot 2 \text{ in.})$
$A = \frac{1}{2}(\frac{5}{4} \text{ in.} \cdot 2 \text{ in.})$
$A = \frac{1}{2}(\frac{10}{4} \text{ in.}^2)$
$A = \frac{10}{8} \text{ in.}^2 = 1\frac{1}{4} \text{ in.}^2$

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8. $P = s + s + s + s$
$P = 12 + 10 + 6 + 12 + 8$
$P = 48 \text{ m}$

$A = l \cdot w + A = \frac{1}{2}(b \cdot h)$
$A = (12 \text{ m} \cdot 8 \text{ m}) + \frac{1}{2}(6 \text{ m} \cdot 8 \text{ m})$
$A = 96 \text{ m}^2 + \frac{1}{2}(48 \text{ m}^2)$
$A = 96 \text{ m}^2 + 24 \text{ m}^2$
$A = 120 \text{ m}^2$

9. $P = s + s + s + s + s + s$
$P = 2 + 9 + 12 + 5 + 10 + 4$
$P = 42 \text{ ft}$

$A = l \cdot w$
$A = (12 \text{ ft} \cdot 5 \text{ ft}) + (2 \text{ ft} \cdot 4 \text{ ft})$
$A = 60 \text{ ft}^2 + 8 \text{ ft}^2$
$A = 68 \text{ ft}^2$

10. $P = s + s + s + s + s + s + s + s$
$P = 8 + (4 \cdot 2) + (2 \cdot 4) + 12$
$P = 8 + 8 + 8 + 12$
$P = 36 \text{ m}$

$A = l \cdot w$
$A = (8 \text{ m} \cdot 2 \text{ m}) + (12 \text{ m} \cdot 4 \text{ m})$
$A = 16 \text{ m}^2 + 48 \text{ m}^2$
$A = 64 \text{ m}^2$

11. $A = \frac{1}{2}(b \cdot h)$
$30 = \frac{1}{2}(10 \cdot h)$
$30 = \frac{1}{2}(10h)$
$\frac{30}{5} = \frac{5h}{5}$
$h = 6 \text{ ft}$

12. $A = \frac{1}{2}(b \cdot h)$
$15 = \frac{1}{2}(b \cdot 10)$
$15 = \frac{1}{2}(10b)$
$\frac{15}{5} = \frac{5b}{5}$
$b = 3 \text{ m}$

13. $A = \frac{1}{2}(b \cdot h)$
$24 = \frac{1}{2}(6 \cdot h)$
$24 = \frac{1}{2}(6h)$
$\frac{24}{3} = \frac{3h}{3}$
$h = 8 \text{ yd}$

17. $A = l \cdot w$
$A = (2 \cdot w) \cdot w$
$A = (2 \cdot 6 \text{ ft}) \cdot 6 \text{ ft}$
$A = 12 \text{ ft} \cdot 6 \text{ ft}$
$A = 72 \text{ ft}^2$

18. $C = \pi d$
$C = 3.14 \cdot 8.6 \text{ in.}$
$C = 27.004 \text{ in.}$
27 beads

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1. $A = \pi r^2$
$A = 3.14(6^2)$
$A = 3.14(36)$
$A = 113.04 \text{ cm}^2$

2. $A = \pi r^2$
$A = 3.14(9^2)$
$A = 3.14(81)$
$A = 254.34 \text{ yd}^2$

3. $A = \pi r^2; d = 42; r = 21$
$A = 3.14(21^2)$
$A = 3.14(441)$
$A = 1{,}384.74 \text{ in.}^2$

4. $A = \pi r^2; d = 20; r = 10$
$A = 3.14(10^2)$
$A = 3.14(100)$
$A = 314 \text{ m}^2$

5. $3 \cdot 15^2$
$3 \cdot 225 = 675 \text{ m}^2$

6. $3 \cdot 2^2$
$3 \cdot 4 = 12 \text{ cm}^2$

7. $3 \cdot 6^2$
$3 \cdot 36 = 108 \text{ ft}^2$

8. $3 \cdot 13^2$
$3 \cdot 169 = 507 \text{ ft}^2$

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15. $A = \pi r^2; d = 4 \text{ in.}; r = 2 \text{ in.}$
$A = 3.14(2^2)$
$A = 3.14 \cdot 4$
$A = 12.56 \text{ in.}^2$

$C = \pi d$
$C = 3.14 \cdot 4$
$C = 12.56 \text{ in.}$

16. $A = \pi r^2; d = 6; r = 3$
$A = 3.14(3^2)$
$A = 3.14(9)$
$A = 28.26 \text{ ft}^2$

$C = \pi d$
$C = 3.14 \cdot 6$
$C = 18.84 \text{ ft}$

17. $A = \pi r^2$
$A = 3.14(2^2)$
$A = 3.14 \cdot 4$
$A = 12.56 \text{ yd}^2$

$C = 2\pi r$
$C = 2 \cdot 3.14 \cdot 2$
$C = 12.56 \text{ yd}$

18. $A = \pi r^2$
$A = 3.14(1^2)$
$A = 3.14 \cdot 1$
$A = 3.14 \text{ yd}^2$

$C = 2\pi r$
$C = 2 \cdot 3.14 \cdot 1$
$C = 6.28 \text{ yd}$

19. $A = \pi r^2; d = 12; r = 6$
$A = 3.14(6^2)$
$A = 3.14 \cdot 36$
$A = 113.04 \text{ cm}^2$

$C = \pi d$
$C = 3.14 \cdot 12$
$C = 37.68 \text{ cm}$

20. $A = \pi r^2$
$A = 3.14(11^2)$
$A = 3.14 \cdot 121$
$A = 379.94 \text{ m}^2$

$C = 2\pi r$
$C = 2 \cdot 3.14 \cdot 11$
$C = 69.08 \text{ m}$

㉑ $A = \pi r^2; d = 4; r = 2$
$A = \frac{1}{2}(\pi r^2)$
$A = \frac{1}{2}(3.14 \cdot 2^2)$
$A = \frac{1}{2}(3.14 \cdot 4)$
$A = \frac{1}{2}(12.56)$
$A = 6.28 \text{ cm}^2$

㉒ $A = \pi r^2; d = 6; r = 3$
$A = \frac{1}{4}(\pi r^2)$
$A = \frac{1}{4}(3.14 \cdot 3^2)$
$A = \frac{1}{4}(3.14 \cdot 9)$
$A = \frac{1}{4}(28.26)$
$A = 7.065 \text{ cm}^2$

㉓ $A = l \cdot w$ and $A = \pi r^2$
$A = (10 \cdot 10) - (3.14 \cdot 5^2)$
$A = 100 - (3.14 \cdot 25)$
$A = 100 - 78.50$
$A = 21.5 \text{ ft}^2$

24. $A = \pi r^2$
$A = 3.14(8^2)$
$A = 3.14(64)$
$A = 200.96 \text{ ft}^2$

25. $A = \pi r^2; d = 4 \text{ ft}; r = 2 \text{ ft}$
$A = 3.14(2^2)$
$A = 3.14(4)$
$A = 12.56 \text{ ft}^2;$ no

26. $A = \pi r^2$
$A = 3.14(6^2)$
$A = 3.14(36)$
$A = 113.04 \text{ ft}^2$

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17. $2(10 \cdot 5) = 100 \text{ in.}^2$
$2(10 \cdot 5) = 100 \text{ in.}^2$
$2(5 \cdot 5) = 50 \text{ in.}^2$
Total Surface Area = 250 in.² or
$2(10 \cdot 5) + 2(10 \cdot 5) + 2(5 \cdot 5) =$
$100 + 100 + 50 = 250 \text{ in.}^2$

18. $6(5 \cdot 5) = 150 \text{ in.}^2$
Total Surface Area = 150 in.²

19. $16 \cdot 3 = 48$ cm²
$2(10 \cdot 3) = 60$ cm²
$2 \cdot \frac{1}{2}(16 \cdot 6) = 96$ cm²
Total Surface Area = 204 cm² or
$(16 \cdot 3) + 2(10 \cdot 3) \cdot 2 \cdot \frac{1}{2}(6 \cdot 16) =$
$48 + 60 + 96 = 204$ cm²

20. $2(4 \cdot 7) = 56$ cm²
$2(4 \cdot 2) = 16$ cm²
$2(2 \cdot 7) = 28$ cm²
Total Surface Area = 100 cm² or
$2(7 \cdot 4) + 2(4 \cdot 2) + 2(2 \cdot 7) =$
$56 + 16 + 28 = 100$ cm²

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1. $A = \pi r^2$ $A = l \cdot w;\ (l = 2\pi r)$
$A = 2(3.14 \cdot 5^2)$ $A = (2 \cdot 3.14 \cdot 5) \cdot 6$
$A = 2(3.14 \cdot 25)$ $A = 188.4$ cm²
$A = 2(78.5)$
$A = 157$ cm²

Total Surface Area = 157 + 188.4 = 345.4 cm²

2. $A = \pi r^2$ $A = l \cdot w;\ (l = 2\pi r)$
$A = 2(3.14 \cdot 2^2)$ $A = (2 \cdot 3.14 \cdot 2) \cdot 10$
$A = 2(3.14 \cdot 4)$ $A = 125.6$ cm²
$A = 2(12.56)$
$A = 25.12$ cm²

Total Surface Area = 25.12 + 125.6 = 150.72 cm²

3. $A = \pi r^2$ $A = l \cdot w;\ (l = 2\pi r)$
$A = 2(3.14 \cdot 2^2)$ $A = (2 \cdot 3.14 \cdot 2) \cdot 6$
$A = 2(3.14 \cdot 4)$ $A = 75.36$ in.²
$A = 2(12.56)$
$A = 25.12$ in.²

Total Surface Area = 25.12 + 75.36 = 100.48 in.²

4. $A = \pi r^2$ $A = l \cdot w;\ (l = 2\pi r)$
$A = 2(3.14 \cdot 3^2)$ $A = (2 \cdot 3.14 \cdot 3) \cdot 7$
$A = 2(3.14 \cdot 9)$ $A = 131.88$ in.²
$A = 2(28.26)$
$A = 56.52$ in.²

Total Surface Area = 56.52 + 131.88 = 188.4 in.²

5. $A = \pi r^2$ $A = l \cdot w;\ (l = 2\pi r)$
$A = 2(3.14 \cdot 3^2)$ $A = (2 \cdot 3.14 \cdot 3) \cdot 4$
$A = 2(3.14 \cdot 9)$ $A = 75.36$ in.²
$A = 2(28.26)$
$A = 56.52$ in.²

Total Surface Area = 56.52 + 75.36 = 131.88 in.²

6. $A = \pi r^2$ $A = l \cdot w;\ (l = 2\pi r)$
$A = 2(3.14 \cdot 4^2)$ $A = (2 \cdot 3.14 \cdot 4) \cdot 5$
$A = 2(3.14 \cdot 16)$ $A = 125.6$ cm²
$A = 2(50.24)$
$A = 100.48$ cm²

Total Surface Area = 100.48 + 125.6 = 226.08 cm²

7. $A = \pi r^2$ $A = l \cdot w;\ (l = 2\pi r)$
$A = 2(3.14 \cdot 3^2)$ $A = (2 \cdot 3.14 \cdot 3) \cdot 6$
$A = 2(3.14 \cdot 9)$ $A = 113.04$ in.²
$A = 2(28.26)$
$A = 56.52$ in.²

Total Surface Area = 56.52 + 113.04 = 169.56 in.²

8. $A = \pi r^2$ $A = l \cdot w;\ (l = 2\pi r)$
$A = 2(3.14 \cdot 6^2)$ $A = (2 \cdot 3.14 \cdot 6) \cdot 5$
$A = 2(3.14 \cdot 36)$ $A = (37.68)5$
$A = 2(113.04)$ $A = 188.4$ cm²
$A = 226.08$

Total Surface Area = 226.08 + 188.4 = 414.48 cm²

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11. $2(10 \cdot 5) = 100$ cm²
$2(10 \cdot 6) = 120$ cm²
$2(5 \cdot 6) = 60$ cm²
Total Surface Area = 280 cm² or
$2(10 \cdot 5) + 2(10 \cdot 6) + 2(5 \cdot 6) =$
$100 + 120 + 60 = 280$ cm²

12. $2(9 \cdot 4) = 72$ in.²
$2(9 \cdot 3) = 54$ in.²
$2(4 \cdot 3) = 24$ in.²
Total Surface Area = 150 in.² or
$2(9 \cdot 4) + 2(9 \cdot 3) + 2(4 \cdot 3) =$
$72 + 54 + 24 = 150$ in.²

13. $9 \cdot 7 = 63$ in.²
$2(9 \cdot 5) = 90$ in.²
$2[\frac{1}{2}(7 \cdot 3)] = 21$ in.²
Total Surface Area = 174 in.² or
$9 \cdot 7 + 2(9 \cdot 5) + 2[\frac{1}{2}(7 \cdot 3)] =$
$63 + 90 + 21 = 174$ in.²

14. $2[\frac{1}{2}(4 \cdot 4)] = 16$ cm²
$8 \cdot 4 = 32$ cm²
$2(8 \cdot 5) = 80$ cm²
Total Surface Area = 128 cm² or
$2[\frac{1}{2}(4 \cdot 4)] + (8 \cdot 4) + 2(8 \cdot 5) =$
$32 + 80 + 16 = 128$ cm²

15. $6(7 \cdot 7) = 294$ ft²
Total Surface Area = 294 ft²

16. 2(5 • 5) = 50 ft
4(5 • 10) = 200 ft
Total Surface Area = 250 ft² or
2(5 • 5) + 4(5 • 10) =
50 + 200 = 250 ft²

17. 2(8 • 6) = 96 in.²
2(8 • 5) = 80 in.²
2(6 • 5) = 60 in.²
Total Surface Area = 236 in.²; no

19. $C = \pi d$
$C = 3.14 \cdot 18$
$C = 56.52$ ft

(J) **Perimeter is the distance around a figure; area is the number of square units needed to cover a figure or a surface.**

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1. $P = s + s + s + s + s + s$
$P = 10 + (3 \cdot 5) + 7 + 2$
$P = 10 + 15 + 7 + 2$
$P = 34$ in.

2. $P = n(s)$
$P = 4 \cdot \frac{3}{4}$
$P = \frac{12}{4} = 3$ in.

3. $P = s + s + s$
$P = (2 \cdot 9) + 12$
$P = 30$ m

4. $P = n(s)$
$P = 6 \cdot 7$
$P = 42$ m

5. $C = \pi d$
$C = 3.14 \cdot 12$
$C = 37.68$ cm

6. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot \frac{3}{4}) + (2 \cdot 1\frac{1}{2})$
$P = 1\frac{1}{2} + 3$
$P = 4\frac{1}{2}$ in.

7. $P = (2 \cdot l) + (2 \cdot w)$
$P = (2 \cdot 7.2) + (2 \cdot 4.5)$
$P = 14.4 + 9$
$P = 23.4$ m

8. $P = n(s)$
$P = 5(2.8)$
$P = 14$ cm

9. $C = 2\pi r$
$C = 2 \cdot 3.14 \cdot 7$
$C = 43.96$ mm

10. $A = l \cdot w$
$A = 1.4 \cdot 1.4$
$A = 1.96$ m²

11. $A = l \cdot w$
$A = 8.2 \cdot 3.7$
$A = 30.34$ cm²

12. $A = \pi r^2$
$A = 3.14(6^2)$
$A = 3.14 \cdot 36$
$A = 113.04$ cm²

13. $A = \frac{1}{2}(b \cdot h)$
$A = \frac{1}{2}(10 \cdot 8)$
$A = \frac{1}{2}(80)$
$A = 40$ m²

14. $A = b \cdot h$
$A = 5 \cdot 2$
$A = 10$ ft²

15. $A = \frac{1}{2}(b \cdot h)$
$A = \frac{1}{2}(9 \cdot 4)$
$A = \frac{1}{2}(36)$
$A = 18$ in.²

16. $P = 4 + 4 + 6 + 4 + 10 + 8$
$P = 36$ m

Area of square: $(A = l \cdot w)$
$4 \cdot 4 = 16$ m²

Area of rectangle: $(A = l \cdot w)$
$10 \cdot 4 = 40$ m²

Total Area: 16 + 40 = 56 m²

17. $P = (3 \cdot 3) + (2 \cdot 5)$
$P = 9 + 10$
$P = 19$ cm

Area of triangle: $(A = \frac{1}{2}(b \cdot h)$
$\frac{1}{2}(3 \cdot 2) = 3$ cm²

Area of rectangle: $(A = l \cdot w)$
$5 \cdot 3 = 15$ cm²

Total Area: 3 + 15 = 18 cm²

18. $C = \pi d$

$C = \frac{1}{2}(3.14 \cdot 10)$

$C = \frac{1}{2}(31.4)$

$C = 15.7$ in.

$P = (2 \cdot 4) + 10$
$P = 8 + 10$
$P = 18$

Total Perimeter: $18 + 15.7 = 33.7$ in.

Area of Circle: ($A = \pi r^2$)
$d = 10$; $r = 5$

$A = \frac{1}{2}(3.14 \cdot 5^2)$

$A = \frac{1}{2}(3.14 \cdot 25)$

$A = \frac{1}{2}(78.5)$

$A = 39.25$ in.²

Area of rectangle: ($A = l \cdot w$)
$A = 10 \cdot 4$
$A = 40$ in.²

Total Area: $39.25 + 40 = 79.25$ in.²

19. $P = 12 + 7 + 3 + 4 + 6 + 4 + 3 + 7$
$P = 46$ cm
or
$P = 12 + (2 \cdot 7) + (2 \cdot 3) +$
$\quad (2 \cdot 4) + 6$
$P = 12 + 14 + 6 + 8 + 6$
$P = 46$ cm

Area of rectangle: ($A = l \cdot w$)
$A = 12 \cdot 3$
$A = 36$ cm²

$A = 2(3 \cdot 4)$
$A = 2 \cdot 12$
$A = 24$ cm²

Total Area: $36 + 24 = 60$ cm²

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20. $n = A \div s$
$n = 45$ m² $\div 5$ m
$n = 9$ m

21. $n = A \div s$
$n = 77$ cm² $\div 11$ cm
$n = 7$ cm

22. 20 in. $= 4 \times s$
20 in. $\div 4 = 4 \div 4 \times s$
5 in. $= s$

29. $2(10 \cdot 4) = 80$ cm²
$2(10 \cdot 5) = 100$ cm²
$2(4 \cdot 5) = 40$ cm²

Total Surface Area $= 220$ cm²

30. $6(5 \cdot 5) = 150$ in.²

31. $A = \frac{1}{2}(l \cdot w)$; $A = l \cdot w$

$2[\frac{1}{2}(5 \cdot 2)] = 10$ cm²
$4 \cdot 5 = 20$ cm²
$2(4 \cdot 3) = 24$ cm²

Total Surface Area $= 54$ cm²

32. $A = \pi r^2$
$A = 2(3.14 \cdot 2^2)$
$A = 2(3.14 \cdot 4)$
$A = 2(12.56) = 25.12$ in.²

$A = l \cdot w$; ($l = 2\pi r$)
$A = (2 \cdot 3.14 \cdot 2) \cdot 6$
$A = 75.36$ in.²

Total Surface Area: $25.12 + 75.36 = 100.48$ in.²

36. $A = \pi r^2$
$A = 2(3.14 \cdot 1^2)$
$A = 2(3.14)$
$A = 6.28$ ft²

$A = l \cdot w$; ($l = \pi d$)
$A = (3.14 \cdot 2) \cdot 2$
$A = 6.28 \cdot 2$
$A = 12.56$ ft²

Total Surface Area: $6.28 + 12.56 = 18.84$ ft²

Chapter 12

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1. $V = (l \cdot w) \cdot h$
$V = (7 \cdot 4) \cdot 2$
$V = 28 \cdot 2$
$V = 56$ cubic units

2. $V = (l \cdot w) \cdot h$
$V = (5 \cdot 3) \cdot 3$
$V = 15 \cdot 3$
$V = 45$ cubic units

3. $V = (l \cdot w) \cdot h$
$V = (6 \cdot 5) \cdot 4$
$V = 30 \cdot 4$
$V = 120$ cubic units

4. $V = (l \cdot w) \cdot h$
$V = (4 \cdot 3) \cdot 2$
$V = 12 \cdot 2$
$V = 24$ cubic units

5. $V = (l \cdot w) \cdot h$
$V = (8 \cdot 5) \cdot 1$
$V = 40 \cdot 1$
$V = 40$ cubic units

6. $V = (l \cdot w) \cdot h$
$V = (7 \cdot 2) \cdot 3$
$V = 14 \cdot 3$
$V = 42$ cubic units

7. $V = (l \cdot w) \cdot h$
$V = (3 \text{ cm} \cdot 2 \text{ cm}) \cdot 3 \text{ cm}$
$V = 6 \text{ cm}^2 \cdot 3 \text{ cm}$
$V = 18 \text{ cm}^3$

8. $V = (l \cdot w) \cdot h$
$V = (4 \text{ cm} \cdot 1 \text{ cm}) \cdot 2 \text{ cm}$
$V = 4 \text{ cm}^2 \cdot 2 \text{ cm}$
$V = 8 \text{ cm}^3$

9. $V = (l \cdot w) \cdot h$
$V = (4 \text{ cm} \cdot 3 \text{ cm}) \cdot 4 \text{ cm}$
$V = 12 \text{ cm}^2 \cdot 4 \text{ cm}$
$V = 48 \text{ cm}^3$

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10. $V = (l \cdot w) \cdot h$
$V = (4 \text{ cm} \cdot 3 \text{ cm}) \cdot 9 \text{ cm}$
$V = 12 \text{ cm}^2 \cdot 9 \text{ cm}$
$V = 108 \text{ cm}^3$

11. $V = (l \cdot w) \cdot h$
$V = (5.2 \text{ m} \cdot 2.4 \text{ m}) \cdot 3.5 \text{ m}$
$V = 12.48 \text{ m}^2 \cdot 3.5 \text{ m}$
$V = 43.68 \text{ m}^3 \approx 43.7 \text{ m}^3$

12. $V = (l \cdot w) \cdot h$
$V = (\frac{3}{4} \text{ in.} \cdot \frac{1}{2} \text{ in.}) \cdot 4 \text{ in.}$
$V = \frac{3}{8} \text{ in.}^2 \cdot 4 \text{ in.}$
$V = \frac{3}{2} \text{ in.}^3 = 1\frac{1}{2} \text{ in.}^3$

13. $V = (l \cdot w) \cdot h$
$V = (8 \text{ m} \cdot 4 \text{ m}) \cdot 7 \text{ m}$
$V = 32 \text{ m}^2 \cdot 7 \text{ m}$
$V = 224 \text{ m}^3$

14. $V = (l \cdot w) \cdot h$
$V = (4.2 \text{ cm} \cdot 3.5 \text{ cm}) \cdot 6 \text{ cm}$
$V = 14.7 \text{ cm}^2 \cdot 6 \text{ cm}$
$V = 88.2 \text{ cm}^3$

15. $V = (l \cdot w) \cdot h$
$V = (8 \text{ in.} \cdot 2 \text{ in.}) \cdot 2 \text{ in.}$
$V = 16 \text{ in.}^2 \cdot 2 \text{ in.}$
$V = 32 \text{ in.}^3$

16. $V = (l \cdot w) \cdot h$
$V = (5 \text{ in.} \cdot 7 \text{ in.}) \cdot 2 \text{ in.}$
$V = 35 \text{ in.}^2 \cdot 2 \text{ in.}$
$V = 70 \text{ in.}^3$

17. $V = (l \cdot w) \cdot h$
$V = (12 \text{ cm} \cdot 8 \text{ cm}) \cdot 10 \text{ cm}$
$V = 96 \text{ cm}^2 \cdot 10 \text{ cm}$
$V = 960 \text{ cm}^3$

18. $V = (l \cdot w) \cdot h$
$V = (\frac{3}{8} \text{ in.} \cdot \frac{2}{3} \text{ in.}) \cdot \frac{1}{2} \text{ in.}$
$V = \frac{1}{4} \text{ in.}^2 \cdot \frac{1}{2} \text{ in.}$
$V = \frac{1}{8} \text{ in.}^3$

19. $V = Bh$
$V = 15 \text{ ft}^2 \cdot 2 \text{ ft}$
$V = 30 \text{ ft}^3$

20. $V = Bh$
$V = 25 \text{ m}^2 \cdot 8 \text{ m}$
$V = 200 \text{ m}^3$

21. $V = Bh$
$V = 46 \text{ cm}^2 \cdot 5.2 \text{ cm}$
$V = 239.2 \text{ cm}^3$

22. $V = (l \cdot w) \cdot h$
$V = (24 \text{ in.} \cdot 18 \text{ in.}) \cdot 12 \text{ in.}$
$V = 432 \text{ in.}^2 \cdot 12 \text{ in.}$
$V = 5{,}184 \text{ in.}^3$

23. Surface area:
$2(24 \text{ in.} \cdot 18 \text{ in.}) + 2(24 \text{ in.} \cdot 12 \text{ in.}) + 2(18 \text{ in.} \cdot 12 \text{ in.}) =$
$2(432 \text{ in.}^2) + 2(288 \text{ in.}^2) + 2(216 \text{ in.}^2) =$
$864 \text{ in.}^2 + 576 \text{ in.}^2 + 432 \text{ in.}^2 = 1{,}872 \text{ in.}^2$

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1. $V = s^3$
$V = 16 \text{ cm}^2 \cdot 4 \text{ cm}$
$V = 64 \text{ cm}^3$

2. $V = s^3$
$V = (10 \text{ in.})^3$
$V = 1{,}000 \text{ in.}^3$

3. $V = (s \cdot s)s$
$V = (3.2 \text{ m} \cdot 3.2 \text{ m}) \cdot 3.2 \text{ m}$
$V = 10.24 \text{ m}^2 \cdot 3.2 \text{ m}$
$V = 32.768 \text{ m}^3 \approx 32.8 \text{ m}^3$

4. $V = s^3$
$V = 36 \text{ ft}^2 \cdot 6 \text{ ft}$
$V = 216 \text{ ft}^3$

5. $V = (s \cdot s)s$
$V = (1\frac{1}{2} \text{ yd} \cdot 1\frac{1}{2} \text{ yd}) \cdot 1\frac{1}{2} \text{ yd}$
$V = (\frac{3}{2} \text{ yd} \cdot \frac{3}{2} \text{ yd}) \cdot \frac{3}{2} \text{ yd}$
$V = \frac{9}{4} \text{ yd}^2 \cdot \frac{3}{2} \text{ yd}$
$V = \frac{27}{8} \text{ yd}^3 = 3\frac{3}{8} \text{ yd}^3$

6. $V = (s \cdot s)s$
$V = (4.5 \text{ m} \cdot 4.5 \text{ m}) \cdot 4.5 \text{ m}$
$V = 20.25 \text{ m}^2 \cdot 4.5 \text{ m}$
$V = 91.125 \text{ m}^3 \approx 91.1 \text{ m}^3$

11. $V = (l \cdot w) \cdot h$
$V = (2 \text{ cm} \cdot 2 \text{ cm}) \cdot 2 \text{ cm}$
$V = 4 \text{ cm}^2 \cdot 2 \text{ cm}$
$V = 8 \text{ cm}^3$
or
$V = s^3$
$V = (2 \text{ cm})^3$
$V = 8 \text{ cm}^3$

12. $V = (l \cdot w) \cdot h$
$V = (3 \text{ cm} \cdot 3 \text{ cm}) \cdot 3 \text{ cm}$
$V = 9 \text{ cm}^2 \cdot 3 \text{ cm}$
$V = 27 \text{ cm}^3$
or
$V = s^3$
$V = (3 \text{ cm})^3$
$V = 27 \text{ cm}^3$

13. $V = (l \cdot w) \cdot h$
$V = (4 \text{ cm} \cdot 3 \text{ cm}) \cdot 5 \text{ cm}$
$V = 12 \text{ cm}^2 \cdot 5 \text{ cm}$
$V = 60 \text{ cm}^3$

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14. $V = (l \cdot w) \cdot h$
$24 \text{ ft}^3 = (2 \text{ ft} \cdot 3 \text{ ft}) \cdot h$
$\frac{24 \text{ ft}^3}{6 \text{ ft}^2} = \frac{6 \text{ ft}^2 \cdot h}{6 \text{ ft}^2}$
$h = 4 \text{ ft}$

15. $V = (l \cdot w) \cdot h$
$248 \text{ m}^3 = (l \cdot 4 \text{ m}) \cdot 6.2 \text{ m}$
$248 \text{ m}^3 = l(4 \text{ m} \cdot 6.2 \text{ m})$
$\frac{248 \text{ m}^3}{24.8 \text{ m}^2} = \frac{l \cdot 24.8 \text{ m}^2}{24.8 \text{ m}^2}$
$l = 10 \text{ m}$

16. $V = (l \cdot w) \cdot h$
$144 \text{ cm}^3 = (6 \text{ cm} \cdot w) \cdot 8 \text{ cm}$
$144 \text{ cm}^3 = w(6 \text{ cm} \cdot 8 \text{ cm})$
$\frac{144 \text{ cm}^3}{48 \text{ cm}^2} = \frac{w \cdot 48 \text{ cm}^2}{48 \text{ cm}^2}$
$w = 3 \text{ cm}$

17. $V = (l \cdot w) \cdot h$
$75 \text{ in.}^3 = (5 \text{ in.} \cdot 3 \text{ in.}) \cdot h$
$\frac{75 \text{ in.}^3}{15 \text{ in.}^2} = \frac{15 \text{ in.}^2 \cdot h}{15 \text{ in.}^2}$
$h = 5 \text{ in.}$

18. $V = (l \cdot w) \cdot h$
$48 \text{ cm}^3 = (2 \text{ cm} \cdot w) \cdot 4 \text{ cm}$
$48 \text{ cm}^3 = w(2 \text{ cm} \cdot 4 \text{ cm})$
$\frac{48 \text{ cm}^3}{8 \text{ cm}^2} = \frac{w \cdot 8 \text{ cm}^2}{8 \text{ cm}^2}$
$w = 6 \text{ cm}$

19. $V = Bh$
$90 \text{ in.}^3 = 6 \text{ in.}^2 \cdot h$
$\frac{90 \text{ in.}^3}{6 \text{ in.}^2} = \frac{6 \text{ in.}^2 \cdot h}{6 \text{ in.}^2}$
$h = 15 \text{ in.}$

20. $V = Bh$
$51.3 \text{ cm}^3 = 5.7 \text{ cm}^2 \cdot h$
$\frac{51.3 \text{ cm}^3}{5.7 \text{ cm}^2} = \frac{5.7 \text{ cm}^2 \cdot h}{5.7 \text{ cm}^2}$
$h = 9 \text{ cm}$

(J) Apple juice box:
Surface area:
$2(3 \text{ in.} \cdot 4 \text{ in.}) + 2(1 \text{ in.} \cdot 4 \text{ in.}) +$
$2(1 \text{ in.} \cdot 3 \text{ in.}) =$
$24 \text{ in.}^2 + 8 \text{ in.}^2 + 6 \text{ in.}^2 = 38 \text{ in.}^2$
$V = (l \cdot w) \cdot h$
$V = (3 \text{ in.} \cdot 1 \text{ in.}) \cdot 4 \text{ in.}$
$V = 3 \text{ in.}^2 \cdot 4 \text{ in.}$
$V = 12 \text{ in.}^3$

Clown box:
Surface area:
$6(8 \text{ cm} \cdot 8 \text{ cm}) =$
$6 \cdot 64 \text{ cm}^2 = 384 \text{ cm}^2$
$V = s^3$
$V = 64 \text{ cm}^2 \cdot 8 \text{ cm}$
$V = 512 \text{ cm}^3$

Spaghetti box:
Surface area:
$2(3 \text{ in.} \cdot 10 \text{ in.}) + 2(1\frac{1}{2} \text{ in.} \cdot 10 \text{ in.}) + 2(3 \text{ in.} \cdot 1$
$\frac{1}{2} \text{ in.}) =$
$60 \text{ in.}^2 + 30 \text{ in.}^2 + 9 \text{ in.}^2 = 99 \text{ in.}^2$
$V = (l \cdot w) \cdot h$
$V = (3 \text{ in.} \cdot 1\frac{1}{2} \text{ in.}) \cdot 10 \text{ in.}$
$V = (3 \text{ in.} \cdot \frac{3}{2} \text{ in.}) \cdot 10 \text{ in.}$
$V = \frac{9}{2} \text{ in.}^2 \cdot 10 \text{ in.}$
$V = 45 \text{ in.}^3$

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1. $V = Bh \text{ or } (\frac{1}{2}bh_1)h_2$
$V = (\frac{1}{2} \cdot 4 \text{ cm} \cdot 3 \text{ cm}) \cdot 10 \text{ cm}$
$V = 6 \text{ cm}^2 \cdot 10 \text{ cm}$
$V = 60 \text{ cm}^3$

2. $V = Bh \text{ or } (\frac{1}{2}bh_1)h_2$
$V = (\frac{1}{2} \cdot 6 \text{ cm} \cdot 2 \text{ cm}) \cdot 8 \text{ cm}$
$V = 6 \text{ cm}^2 \cdot 8 \text{ cm}$
$V = 48 \text{ cm}^3$

3. $V = Bh \text{ or } (\frac{1}{2}bh_1)h_2$
$V = (\frac{1}{2} \cdot 4 \text{ cm} \cdot 2 \text{ cm}) \cdot 7 \text{ cm}$
$V = 4 \text{ cm}^2 \cdot 7 \text{ cm}$
$V = 28 \text{ cm}^3$

4. $V = Bh$ or $(\pi r^2)h$
$V = 3.14 \cdot (3 \text{ cm})^2 \cdot 9 \text{ cm}$
$V = (3.14 \cdot 9 \text{ cm}^2) \cdot 9 \text{ cm}$
$V = 28.26 \text{ cm}^2 \cdot 9 \text{ cm}$
$V = 254.34 \text{ cm}^3 \approx 254.3 \text{ cm}^3$

5. $V = Bh$ or $(\pi r^2)h$
$V = 3.14 \cdot (5 \text{ cm})^2 \cdot 6 \text{ cm}$
$V = (3.14 \cdot 25 \text{ cm}^2) \cdot 6 \text{ cm}$
$V = 78.5 \text{ cm}^2 \cdot 6 \text{ cm}$
$V = 471 \text{ cm}^3$

6. $V = Bh$ or $(\pi r^2)h$
$V = 3.14 \cdot (4 \text{ cm})^2 \cdot 10 \text{ cm}$
$V = (3.14 \cdot 16 \text{ cm}^2) \cdot 10 \text{ cm}$
$V = 50.24 \text{ cm}^2 \cdot 10 \text{ cm}$
$V = 502.4 \text{ cm}^3$

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18. $V = (l \cdot w) \cdot h$
$36 \text{ ft}^3 = (2 \text{ ft} \cdot 3 \text{ ft}) \cdot h$
$\dfrac{36 \text{ ft}^3}{6 \text{ ft}^2} = \dfrac{6 \text{ ft}^2 \cdot h}{6 \text{ ft}^2}$
$h = 6 \text{ ft}$

19. $V = (l \cdot w) \cdot h$
$162 \text{ m}^3 = (l \cdot 4 \text{ m}) \cdot 4.5 \text{ m}$
$162 \text{ m}^3 = l(4 \text{ m} \cdot 4.5 \text{ m})$
$\dfrac{162 \text{ m}^3}{18 \text{ m}^2} = \dfrac{l \cdot 18 \text{ m}^2}{18 \text{ m}^2}$
$l = 9 \text{ m}$

20. $V = (l \cdot w) \cdot h$
$240 \text{ cm}^3 = (5 \text{ cm} \cdot w) \cdot 12 \text{ cm}$
$240 \text{ cm}^3 = w(5 \text{ cm} \cdot 12 \text{ cm})$
$\dfrac{240 \text{ cm}^3}{60 \text{ cm}^2} = \dfrac{w \cdot 60 \text{ cm}^2}{60 \text{ cm}^2}$
$w = 4 \text{ cm}$

24. $V = Bh$
$V = (\pi r^2)h$
$V = 3.14 \cdot (9 \text{ ft})^2 \cdot 4 \text{ ft}$
$V = 254.34 \text{ ft}^2 \cdot 4 \text{ ft}$
$V = 1{,}017.36 \text{ ft}^3$

25. Students may solve exact answer or they may estimate.

$1{,}017.36 \cdot 7.5 \text{ gal} = 7{,}630.2 \text{ gal}$
$1{,}017 \cdot 8 \text{ gal} = 8{,}136 \text{ gal}$

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1. top & bottom: 2(7 cm • 1 cm) = 14 cm²
front & back: 2(7 cm • 1 cm) = 14 cm²
left & right sides: 2(1 cm • 1 cm) = 2 cm²
Total Surface Area = 30 cm²

2. top & bottom: 2(10 cm • 1 cm) = 20 cm²
front & back: 2(10 cm • 1 cm) = 20 cm²
left & right sides: 2(1 cm • 1 cm) = 2 cm²
Total Surface Area = 42 cm²

top & bottom: 2(5 cm • 2 cm) = 20 cm²
front & back: 2(5 cm • 1 cm) = 10 cm²
left & right sides: 2(2 cm • 1 cm) = 4 cm²
Total Surface Area = 34 cm²

3. top & bottom: 2(12 cm • 1 cm) = 24 cm²
front & back: 2(12 cm • 1 cm) = 24 cm²
left & right sides: 2(1 cm • 1 cm) = 2 cm²
Total Surface Area = 50 cm²

top & bottom: 2(6 cm • 2 cm) = 24 cm²
front & back: 2(6 cm • 1 cm) = 12 cm²
left & right sides: 2(2 cm • 1 cm) = 4 cm²
Total Surface Area = 40 cm²

top & bottom: 2(4 cm • 3 cm) = 24 cm²
front & back: 2(4 cm • 1 cm) = 8 cm²
left & right sides: 2(3 cm • 1 cm) = 6 cm²
Total Surface Area = 38 cm²

top & bottom: 2(3 cm • 2 cm) = 12 cm²
front & back: 2(3 cm • 2 cm) = 12 cm²
left & right sides: 2(2 cm • 2 cm) = 8 cm²
Total Surface Area = 32 cm²

4. top & bottom: 2(16 cm • 1 cm) = 32 cm²
front & back: 2(16 cm • 1 cm) = 32 cm²
left & right sides: 2(1 cm • 1 cm) = 2 cm²
Total Surface Area = 66 cm²

top & bottom: 2(8 cm • 2 cm) = 32 cm²
front & back: 2(8 cm • 1 cm) = 16 cm²
left & right sides: 2(2 cm • 1 cm) = 4 cm²
Total Surface Area = 52 cm²

top & bottom: 2(4 cm • 2 cm) = 16 cm²
front & back: 2(4 cm • 2 cm) = 16 cm²
left & right sides: 2(2 cm • 2 cm) = 8 cm²
Total Surface Area = 40 cm²

5. top & bottom: 2(24 cm • 1 cm) = 48 cm²
front & back: 2(24 cm • 1 cm) = 48 cm²
left & right sides: 2(1 cm • 1 cm) = 2 cm²
Total Surface Area = 98 cm²

top & bottom: 2(12 cm • 2 cm) = 48 cm²
front & back: 2(12 cm • 1 cm) = 24 cm²
left & right sides: 2(2 cm • 1 cm) = 4 cm²
Total Surface Area = 76 cm²

top & bottom: 2(8 cm • 3 cm) = 48 cm²
front & back: 2(8 cm • 1 cm) = 16 cm²
left & right sides: 2(3 cm • 1 cm) = 6 cm²
Total Surface Area = 70 cm²

top & bottom: 2(6 cm • 4 cm) = 48 cm²
front & back: 2(6 cm • 1 cm) = 12 cm²
left & right sides: 2(4 cm • 1 cm) = 8 cm²
Total Surface Area = 68 cm²

top & bottom: 2(6 cm • 2 cm) = 24 cm²
front & back: 2(6 cm • 2 cm) = 24 cm²
left & right sides: 2(2 cm • 2 cm) = 8 cm²
Total Surface Area = 56 cm²

top & bottom: 2(4 cm • 3 cm) = 24 cm²
front & back: 2(4 cm • 2 cm) = 16 cm²
left & right sides: 2(3 cm • 2 cm) = 12 cm²
Total Surface Area = 52 cm²

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6. Lateral Surface Area
$LS = (2\pi r)h$
$LS = 2(3.14 \cdot 3 \text{ cm}) \cdot 4 \text{ cm}$
$LS = 2(9.42 \text{ cm}) \cdot 4 \text{ cm}$
$LS = 18.84 \text{ cm} \cdot 4 \text{ cm}$
$LS = 75.36 \text{ cm}^2 \approx 75 \text{ cm}^2$

$LS = (2\pi r)h$
$LS = 2(3.14 \cdot 1 \text{ cm}) \cdot 12 \text{ cm}$
$LS = 2(3.14 \text{ cm}) \cdot 12 \text{ cm}$
$LS = 6.28 \text{ cm} \cdot 12 \text{ cm}$
$LS = 75.36 \text{ cm}^2 \approx 75 \text{ cm}^2$

Volume
$V = (\pi r^2)h$
$V = 3.14 \cdot (3 \text{ cm})^2 \cdot 4 \text{ cm}$
$V = (3.14 \cdot 9 \text{ cm}^2) \cdot 4 \text{ cm}$
$V = 28.26 \text{ cm}^2 \cdot 4 \text{ cm}$
$V = 113.04 \text{ cm}^3 \approx 113 \text{ cm}^3$

$V = (\pi r^2)h$
$V = 3.14 \cdot (1 \text{ cm})^2 \cdot 12 \text{ cm}$
$V = (3.14 \cdot 1 \text{ cm}^2) \cdot 12 \text{ cm}$
$V = 3.14 \text{ cm}^2 \cdot 12 \text{ cm}$
$V = 37.68 \text{ cm}^3 \approx 38 \text{ cm}^3$

7. Lateral Surface Area
$LS = (2\pi r)h$
$LS = 2(3.14 \cdot 1.5 \text{ cm}) \cdot 14 \text{ cm}$
$LS = 2(4.71 \text{ cm}) \cdot 14 \text{ cm}$
$LS = 9.42 \text{ cm} \cdot 14 \text{ cm}$
$LS = 131.88 \text{ cm}^2 \approx 132 \text{ cm}^2$

$LS = (2\pi r)h$
$LS = 2(3.14 \cdot 1 \text{ cm}) \cdot 21 \text{ cm}$
$LS = 2(3.14 \text{ cm}) \cdot 21 \text{ cm}$
$LS = 6.28 \text{ cm} \cdot 21 \text{ cm}$
$LS = 131.88 \text{ cm}^2 \approx 132 \text{ cm}^2$

Volume
$V = (\pi r^2)h$
$V = 3.14 \cdot (1.5 \text{ cm})^2 \cdot 14 \text{ cm}$
$V = (3.14 \cdot 2.25 \text{ cm}^2) \cdot 14 \text{ cm}$
$V = 7.065 \text{ cm}^2 \cdot 14 \text{ cm}$
$V = 98.91 \text{ cm}^3 \approx 99 \text{ cm}^3$

$V = (\pi r^2)h$
$V = 3.14 \cdot (1 \text{ cm})^2 \cdot 21 \text{ cm}$
$V = (3.14 \cdot 1 \text{ cm}^2) \cdot 21 \text{ cm}$
$V = 3.14 \text{ cm}^2 \cdot 21 \text{ cm}$
$V = 65.94 \text{ cm}^3 \approx 66 \text{ cm}^3$

8. Lateral Surface Area
$LS = 2(6 \text{ cm} \cdot 2 \text{ cm}) = 24 \text{ cm}^2$
$LS = 2(4 \text{ cm} \cdot 2 \text{ cm}) = 16 \text{ cm}^2$
$LS = 40 \text{ cm}^2$

$LS = 2(5 \text{ cm} \cdot 2 \text{ cm}) = 20 \text{ cm}^2$
$LS = 2(5 \text{ cm} \cdot 2 \text{ cm}) = 20 \text{ cm}^2$
$LS = 40 \text{ cm}^2$

Volume
$V = (l \cdot w) \cdot h$
$V = (6 \text{ cm} \cdot 4 \text{ cm}) \cdot 2 \text{ cm}$
$V = 24 \text{ cm}^2 \cdot 2 \text{ cm}$
$V = 48 \text{ cm}^3$

$V = (l \cdot w) \cdot h$
$V = (5 \text{ cm} \cdot 5 \text{ cm}) \cdot 2 \text{ cm}$
$V = 25 \text{ cm}^2 \cdot 2 \text{ cm}$
$V = 50 \text{ cm}^3$

J Students may refer to the chart on page 268 to find the least amount of surface area for 16 and 24 blocks. From that chart they should be able to follow the pattern to find the least surface area for 36.

Surface Area for containers holding 36 blocks.
36 in. • 1 in. • 1 in.; 146 in.²
18 in. • 2 in. • 1 in.; 112 in.²
12 in. • 3 in. • 1 in.; 102 in.²
9 in. • 4 in. • 1 in.; 98 in.²
6 in. • 6 in. • 1 in.; 96 in.²
9 in. • 2 in. • 2 in.; 80 in.²
6 in. • 3 in. • 2 in.; 72 in.²
4 in. • 3 in. • 3 in.; 66 in.²; the least surface area

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5. $V = (l \cdot w) \cdot h$
$V = (3 \text{ cm} \cdot 3 \text{ cm}) \cdot 3 \text{ cm}$
$V = 9 \text{ cm}^2 \cdot 3 \text{ cm}$
$V = 27 \text{ cm}^3$

6. $V = (l \cdot w) \cdot h$
$V = (4 \text{ cm} \cdot 1 \text{ cm}) \cdot 5 \text{ cm}$
$V = 4 \text{ cm}^2 \cdot 5 \text{ cm}$
$V = 20 \text{ cm}^3$

7. $V = Bh$
$V = 6 \text{ cm}^2 \cdot 2 \text{ cm}$
$V = 12 \text{ cm}^3$

8. $V = (l \cdot w) \cdot h$
$V = (3 \text{ cm} \cdot 2 \text{ cm}) \cdot 5 \text{ cm}$
$V = 6 \text{ cm}^2 \cdot 5 \text{ cm}$
$V = 30 \text{ cm}^3$

9. $V = (l \cdot w) \cdot h$
$V = (4.2 \text{ m} \cdot 1.5 \text{ m}) \cdot 2.8 \text{ m}$
$V = 6.3 \text{ m}^2 \cdot 2.8 \text{ m}$
$V = 17.64 \text{ m}^3 \approx 17.6 \text{ m}^3$

10. $V = (l \cdot w) \cdot h$
$V = (\frac{2}{3} \text{ m} \cdot \frac{1}{2} \text{ m}) \cdot 6 \text{ m}$
$V = \frac{1}{3} \text{ m}^2 \cdot 6 \text{ m}$
$V = 2 \text{ m}^3$

11. $V = s^3$
$V = (4 \text{ ft})^3$
$V = 4 \text{ ft} \cdot 4 \text{ ft} \cdot 4 \text{ ft}$
$V = 64 \text{ ft}^3$

12. $V = s^3$
$V = (2 \text{ yd})^3$
$V = 2 \text{ yd} \cdot 2 \text{ yd} \cdot 2 \text{ yd}$
$V = 8 \text{ yd}^3$

13. $V = s^3$
$V = (3.2 \text{ m})^3$
$V = 3.2 \text{ m} \cdot 3.2 \text{ m} \cdot 3.2 \text{ m}$
$V = 32.768 \text{ m}^3 \approx 32.8 \text{ m}^3$

14. $V = (\frac{1}{2}bh_1)h_2$
$V = \frac{1}{2}(5 \text{ cm} \cdot 2 \text{ cm}) \cdot 3 \text{ cm}$
$V = \frac{1}{2}(10 \text{ cm}^2) \cdot 3 \text{ cm}$
$V = 5 \text{ cm}^2 \cdot 3 \text{ cm}$
$V = 15 \text{ cm}^3$

15. $V = (\frac{1}{2}bh_1)h_2$
$V = \frac{1}{2}(4 \text{ cm} \cdot 6 \text{ cm}) \cdot 5 \text{ cm}$
$V = \frac{1}{2}(24 \text{ cm}^2) \cdot 5 \text{ cm}$
$V = 12 \text{ cm}^2 \cdot 5 \text{ cm}$
$V = 60 \text{ cm}^3$

16. $V = (\frac{1}{2}bh_1)h_2$
$V = \frac{1}{2}(6 \text{ cm} \cdot 4 \text{ cm}) \cdot 2 \text{ cm}$
$V = \frac{1}{2}(24 \text{ cm}^2) \cdot 2 \text{ cm}$
$V = 12 \text{ cm}^2 \cdot 2 \text{ cm}$
$V = 24 \text{ cm}^3$

17. $V = (\pi r^2)h$
$V = 3.14 \cdot (2 \text{ cm})^2 \cdot 7 \text{ cm}$
$V = (3.14 \cdot 4 \text{ cm}^2) \cdot 7 \text{ cm}$
$V = 12.56 \text{ cm}^2 \cdot 7 \text{ cm}$
$V = 87.92 \text{ cm}^3 \approx 87.9 \text{ cm}^3$

18. $V = (\pi r^2)h$
$V = 3.14 \cdot (6 \text{ cm})^2 \cdot 5 \text{ cm}$
$V = (3.14 \cdot 36 \text{ cm}^2) \cdot 5 \text{ cm}$
$V = 113.04 \text{ cm}^2 \cdot 5 \text{ cm}$
$V = 565.2 \text{ cm}^3$

19. $V = (\pi r^2)h$
$V = 3.14 \cdot (3 \text{ in.})^2 \cdot 6 \text{ in.}$
$V = (3.14 \cdot 9 \text{ in.}^2) \cdot 6 \text{ in.}$
$V = 28.26 \text{ in.}^2 \cdot 6 \text{ in.}$
$V = 169.56 \text{ in.}^3 \approx 169.6 \text{ in.}^3$

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24. $V = (l \cdot w) \cdot h$
$36 \text{ ft}^3 = (3 \text{ ft} \cdot 3 \text{ ft}) \cdot h$
$\frac{36 \text{ ft}^3}{9 \text{ ft}^2} = \frac{9 \text{ ft}^2 \cdot h}{9 \text{ ft}^2}$
$h = 4 \text{ ft}$

25. $V = (l \cdot w) \cdot h$
$70 \text{ m}^3 = (l \cdot 2 \text{ m}) \cdot 3.5 \text{ m}$
$70 \text{ m}^3 = l(2 \text{ m} \cdot 3.5 \text{ m})$
$\frac{70 \text{ m}^3}{7 \text{ m}^2} = \frac{l \cdot 7 \text{ m}^2}{7 \text{ m}^2}$
$l = 10 \text{ m}$

26. $V = (l \cdot w) \cdot h$
$216 \text{ cm}^3 = (6 \text{ cm} \cdot w) \cdot 9 \text{ cm}$
$216 \text{ cm}^3 = w(6 \text{ cm} \cdot 9 \text{ cm})$
$\frac{216 \text{ cm}^3}{54 \text{ cm}^2} = \frac{w \cdot 54 \text{ cm}^2}{54 \text{ cm}^2}$
$w = 4 \text{ cm}$

27. $V = (l \cdot w) \cdot h$
$80 \text{ in.}^3 = (5 \text{ in.} \cdot 2 \text{ in.}) \cdot h$
$\frac{80 \text{ in.}^3}{10 \text{ in.}^2} = \frac{10 \text{ in.}^2 \cdot h}{10 \text{ in.}^2}$
$h = 8 \text{ in.}$

28. $V = (l \cdot w) \cdot h$
$144 \text{ cm}^3 = (6 \text{ cm} \cdot w) \cdot 4 \text{ cm}$
$144 \text{ cm}^3 = w(6 \text{ cm} \cdot 4 \text{ cm})$
$\frac{144 \text{ cm}^3}{24 \text{ cm}^2} = \frac{w \cdot 24 \text{ cm}^2}{24 \text{ cm}^2}$
$w = 6 \text{ cm}$

29. $V = (l \cdot w) \cdot h$
$V = (9 \text{ ft} \cdot 4 \text{ ft}) \cdot 1.5 \text{ ft}$
$V = 36 \text{ ft}^2 \cdot 1.5 \text{ ft}$
$V = 54 \text{ ft}^3$

30. $V = (l \cdot w) \cdot h$
$V = (4 \text{ ft} \cdot 4 \text{ ft}) \cdot 1.5 \text{ ft}$
$V = 16 \text{ ft}^2 \cdot 1.5 \text{ ft}$
$V = 24 \text{ ft}^3$

31. $V = (\pi r^2)h$
$V = 3.14 \cdot (10 \text{ in.})^2 \cdot 37 \text{ in.}$
$V = (3.14 \cdot 100 \text{ in.}^2) \cdot 37 \text{ in.}$
$V = 314 \text{ in.}^2 \cdot 37 \text{ in.}$
$V = 11,618 \text{ in.}^3$

Chapter 13

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24. $\frac{480 \text{ mi}}{16 \text{ gal}} = \frac{n}{1 \text{ gal}}$

$n = 480 \text{ mi} \div 16 \text{ gal}$

$n = 30 \text{ mi/gal (or mpg)}$

25. $\frac{\$48}{8 \text{ hr}} = \frac{n}{1 \text{ hr}}$

$n = \$48 \div 8 \text{ hr}$

$n = \$6/\text{hr}$

26. $\frac{2{,}250 \text{ mi}}{3 \text{ d}} = \frac{n}{1 \text{ d}}$

$n = 2{,}250 \text{ mi} \div 3 \text{ d}$

$n = 750 \text{ mi/day}$

27. $\frac{30 \text{ pg}}{60 \text{ min}} = \frac{n}{1 \text{ min}}$

$n = 30 \text{ pg} \div 60 \text{ min}$

$n = \frac{30 \text{ pg}}{60 \text{ min}} = \frac{1}{2} \text{ pg/min}$

28. $\frac{\$3.16}{4 \text{ lb}} = \frac{n}{1 \text{ lb}}$

$n = \$3.16 \div 4 \text{ lb}$

$n = \$0.79/\text{lb}$

29. $\frac{165 \text{ words}}{3 \text{ min}} = \frac{n}{1 \text{ min}}$

$n = 165 \text{ words} \div 3 \text{ min}$

$n = 55 \text{ words/min}$

30. $\frac{\$3.15}{1 \text{ gal}} = \frac{n}{5 \text{ gal}}$

$n = 5 \times \$3.15$

$n = \$15.75$

31. $\frac{\$7}{1 \text{ hr}} = \frac{n}{4 \text{ hr}}$

$n = 4 \times \$7$

$n = \$28$

32. $\frac{60 \text{ mi}}{1 \text{ hr}} = \frac{n}{6 \text{ hr}}$

$n = 6 \times 60 \text{ mi}$

$n = 360 \text{ mi}$

33. $\frac{230 \text{ mi}}{1 \text{ d}} = \frac{n}{9 \text{ d}}$

$n = 9 \times 230 \text{ mi}$

$n = 2{,}070 \text{ mi}$

34. $\frac{7 \text{ km}}{1 \text{ hr}} = \frac{n}{0.5 \text{ hr}}$

$n = 0.5 \times 7 \text{ km}$

$n = 3.5 \text{ km}$

35. $\frac{\$10}{1 \text{ hr}} = \frac{n}{3.5 \text{ hr}}$

$n = 3.5 \times \$10$

$n = \$35$

36. $\frac{180 \text{ mi}}{2 \text{ hr}} = \frac{n}{6}$

$n = 3 \times 180 \text{ mi}$

$n = 540 \text{ mi}$

37. $\frac{420 \text{ mi}}{2 \text{ hr}} = \frac{n}{4 \text{ hr}}$

$n = 2 \times 420 \text{ mi}$

$n = 840 \text{ mi}$

38. Note: Finding the unit rate first makes this problem easier to solve.

$\frac{300 \text{ mi}}{12 \text{ gal}} = \frac{1{,}000 \text{ mi}}{n}$

$\frac{300 \text{ mi}}{12 \text{ gal}} = \frac{25 \text{ mi}}{1 \text{ gal}}$

$\frac{25 \text{ mi}}{1 \text{ gal}} = \frac{1{,}000 \text{ mi}}{n}$

$n = 1{,}000 \div 25 = 40 \text{ gal}$

$n = 40 \times 1 \text{ gal}$

$n = 40 \text{ gal}$

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10–12.

ft	5,280	10,560	15,840	21,120	26,400
mi	1	2	3	4	5

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21. $4 \times 5 = 20$

$4 \times \$32.50 = \$130.00$

22. $2 \times 12 = 24$

$2 \times \$78 = \$156$

23. $9 \times 3 = 27$

$9 \times \$19.50 = \$175.50$

24. $2 \times 20 = 40$
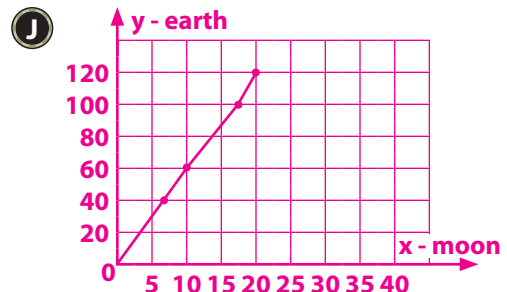
$2 \times 560 \text{ mi} = 1{,}120 \text{ mi}$

25. $20 + 30 = 50$

$560 \text{ mi} + 840 \text{ mi} = 1{,}400 \text{ mi}$

26. $20 \div 5 = 4$

$560 \div 5 = 112 \text{ mi}$

J

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13. $\begin{array}{r} 0.5 \\ 4\overline{)2.0} \\ -\underline{2\,0} \\ 0 \end{array}$ $\qquad$ $\begin{array}{r} 0.5 \\ 30\overline{)15.0} \\ -\underline{15\,0} \\ 0 \end{array}$

$$0.5 = 0.5$$

14.
$$\begin{array}{r} 0.375 \\ 8\overline{)3.000} \\ -24 \\ \hline 60 \\ -56 \\ \hline 40 \\ -40 \\ \hline 0 \end{array} \qquad \begin{array}{r} 0.25 \\ 16\overline{)4.00} \\ -32 \\ \hline 80 \\ -80 \\ \hline 0 \end{array}$$

$$0.375 \neq 0.25$$

15.
$$\begin{array}{r} 0.\overline{6} \\ 3\overline{)2.00} \\ -18 \\ \hline 20 \end{array} \qquad \begin{array}{r} 0.6 \\ 5\overline{)3.0} \\ -30 \\ \hline 0 \end{array}$$

$$0.\overline{6} \neq 0.6$$

16.
$$\begin{array}{r} 0.125 \\ 72\overline{)9.000} \\ -72 \\ \hline 180 \\ -144 \\ \hline 360 \\ -360 \\ \hline 0 \end{array} \qquad \begin{array}{r} 0.125 \\ 48\overline{)6.000} \\ -48 \\ \hline 120 \\ -96 \\ \hline 240 \\ -240 \\ \hline 0 \end{array}$$

$$0.125 = 0.125$$

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23. $\dfrac{\$6}{4\text{ lb}} = \dfrac{\$15}{10\text{ lb}}$

$\$6 \div 4 = \$1.50/\text{lb}$

$\$15 \div 10 = \$1.50/\text{lb}$

24. $\dfrac{\$2}{12\text{ eggs}} = \dfrac{\$3}{18\text{ eggs}}$

$\$2 \div 12 = \$0.1\overline{6}/\text{egg}$

$\$3 \div 18 = \$0.1\overline{6}/\text{egg}$

25. $\dfrac{\$7}{5\text{ bottles}} \neq \dfrac{\$8}{6\text{ bottles}}$

$\$7 \div 5 = \$1.40/\text{bottle}$

$\$8 \div 6 \approx \$1.33/\text{bottle}$

26. $\dfrac{55¢}{12\text{ oz}} \neq \dfrac{95¢}{20\text{ oz}}$

$\$0.55 \div 12 = \$0.045/\text{oz}$

$\$0.95 \div 20 = \$0.047/\text{oz}$

27. $\dfrac{\$1}{1\text{ qt}} = \dfrac{\$4}{\cancel{1\text{ gal}}\ 4\text{ qt}}$

$\$1 \div 1 = \$1/\text{qt}$

$\$4 \div 4 = \$1/\text{qt}$

28. $\dfrac{50¢}{5\text{ oz}} \neq \dfrac{75¢}{8\text{ oz}}$

$\$0.50 \div 5 = \$0.10/\text{oz}$

$\$0.75 \div 8 \approx \$0.09/\text{oz}$

29. $\dfrac{3\text{ hr}}{2\text{ driveways}} = \dfrac{n}{5\text{ driveways}}$

$3\text{ hr} \div 2 = 1.5\text{ hr/driveway};$

$n = 5 \cdot 1.5$

$n = 7.5\text{ hr}$

30. $\dfrac{480\text{ mi}}{3\text{ hr}} = \dfrac{n}{5\text{ hr}}$

$480\text{ mi} \div 3\text{ hr} = 160\text{ mi/hr (or mph)}$

$n = 5 \cdot 160\text{ mi}$

$n = 800\text{ mi}$

31. $\dfrac{\$15}{2\text{ pizzas}} = \dfrac{n}{7\text{ pizzas}}$

$\$15 \div 2 = \$7.50/\text{pizza}$

$n = 7 \cdot \$7.50$

$n = \$52.50$

32. $\dfrac{30\text{ hr}}{25\text{ items}} = \dfrac{n}{60\text{ items}}$

$30 \div 25 = 1.2\text{ items/hr}$

$n = 60 \times 1.2$

$n = 72\text{ items/hr}$

33. $\dfrac{3}{1} = \dfrac{n}{5}$

$5 \times 3 = n$

$n = 15\text{ votes}$

34. $\dfrac{24}{3} = \dfrac{n}{4}$

$24 \times 4 = 3n$

$\dfrac{96}{3} = \dfrac{3n}{3}$

$n = 32\text{ ounces}$

35. $\dfrac{36}{120} = \dfrac{n}{10}$

$10 \cdot 36 = 120n$

$\dfrac{360}{120} = \dfrac{120n}{10}$

$n = 3\text{ students}$

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1. $\dfrac{10}{5} = \dfrac{70}{n}$ or $\dfrac{10}{70} = \dfrac{5}{n}$

$10n = 5 \cdot 70$

$\dfrac{10n}{10} = \dfrac{350}{10}$

$n = 35\text{ cm}$

2. $\dfrac{8}{12} = \dfrac{6}{n}$ or $\dfrac{8}{6} = \dfrac{12}{n}$

$8n = 12 \cdot 6$

$\dfrac{8n}{8} = \dfrac{72}{8}$

$n = 9\text{ m}$

3. $\dfrac{10}{n} = \dfrac{75}{60}$ or $\dfrac{10}{75} = \dfrac{n}{60}$

$60 \cdot 10 = 75n$

$\dfrac{600}{75} = \dfrac{75n}{75}$

$n = 8\text{ cm}$

4. $\dfrac{12}{n} = \dfrac{9}{15}$ or $\dfrac{12}{9} = \dfrac{n}{15}$

$15 \cdot 12 = 9n$

$\dfrac{180}{9} = \dfrac{9n}{9}$

$n = 20\text{ m}$

5. $\frac{15}{n} = \frac{30}{60}$ or $\frac{15}{30} = \frac{n}{60}$

$60 \cdot 15 = 30n$

$\frac{900}{30} = \frac{30n}{30}$

$n = 30$ cm

6. $\frac{n}{60} = \frac{25}{125}$ or $\frac{n}{25} = \frac{60}{125}$

$125n = 60 \cdot 25$

$\frac{125n}{125} = \frac{1,500}{125}$

$n = 12$ cm

7. $\frac{2}{4} = \frac{6}{n}$

$2n = 4 \cdot 6$

$\frac{2n}{2} = \frac{24}{2}$

$n = 12$ in.

8. $\frac{9}{12} = \frac{n}{10}$

$10 \cdot 9 = 12n$

$\frac{90}{12} = \frac{12n}{12}$

$n = 7.5$ in.

9. $\frac{\$0.48}{3} = \frac{n}{20}$

$20 \cdot \$0.48 = 3n$

$\frac{\$9.60}{3} = \frac{3n}{3}$

$n = \$3.20$

10. $\frac{126}{4.5} = \frac{n}{8}$

$8 \cdot 126 = 4.5n$

$\frac{1,008}{4.5} = \frac{4.5n}{4.5}$

$n = 224$ miles

11. $\frac{9}{16.5} \neq \frac{10.5}{24}$

$24 \cdot 9 = 216$

$16.5 \cdot 10.5 = 173.25$

216 cm $\neq 173.25$ cm

12. $\frac{50}{25} = \frac{20}{n}$

$50n = 25 \cdot 20$

$\frac{50n}{50} = \frac{500}{50}$

$n = 10$ m

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1. $\frac{1}{12} = \frac{1.2}{n}$

$n = 12 \cdot 1.2$

$n = 14.4$ ft

2. $\frac{1}{12} = \frac{3.5}{n}$

$n = 12 \cdot 3.5$

$n = 42$ ft

3. $\frac{1}{12} = \frac{2.3}{n}$

$n = 12 \cdot 2.3$

$n = 27.6$ ft

4. $\frac{1}{12} = \frac{0.5}{n}$ $\frac{1}{12} = \frac{1}{n}$

$n = 12 \cdot 0.5$ $n = 12 \cdot 1$

$n = 6$ $n = 12$

$n = 6$ ft long $n = 12$ ft wide

5. $\frac{1}{32} = \frac{3}{n}$

$n = 32 \cdot 3$

$n = 96$ km

6. $\frac{1}{32} = \frac{4.5}{n}$

$n = 32 \cdot 4.5$

$n = 144$ km

7. $\frac{1}{32} = \frac{7}{n}$

$n = 32 \cdot 7$

$n = 224$ km

8. $\frac{1}{32} = \frac{5.5}{n}$

$n = 32 \cdot 5.5$

$n = 176$ km

9. $\frac{1}{32} = \frac{3.5}{n}$

$n = 32 \cdot 3.5$

$n = 112$ km

10. $\frac{1}{32} = \frac{6}{n}$

$n = 32 \cdot 6$

$n = 192$ km

11. $\frac{1}{32} = \frac{5}{n}$

$n = 32 \cdot 5$

$n = 160$ km

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15. $\frac{1}{150} = \frac{4}{n}$

$n = 150 \cdot 4$

$n = 600$ mi

16. $\frac{1}{150} = \frac{9}{n}$

$n = 150 \cdot 9$

$n = 1,350$ mi

17. $\frac{1}{150} = \frac{3.6}{n}$

$n = 150 \cdot 3.6$

$n = 540$ mi

18. $\frac{1}{150} = \frac{0.6}{n}$

$n = 150 \cdot 0.6$

$n = 90$ mi

19. $\frac{1}{150} = \frac{5.8}{n}$

$n = 150 \cdot 5.8$

$n = 870$ mi

20. $\frac{1}{150} = \frac{13}{n}$

$n = 150 \cdot 13$

$n = 1{,}950$ mi

21. $\frac{1}{16} = \frac{n}{80}$

$\frac{80}{16} = \frac{16n}{16}$

$n = 5$ in.

22. $\frac{1}{16} = \frac{n}{160}$

$\frac{160}{16} = \frac{16n}{16}$

$n = 10$ in.

23. $\frac{1}{16} = \frac{n}{120}$

$\frac{120}{16} = \frac{16n}{16}$

$n = 7.5$ in.

24. $\frac{1}{16} = \frac{n}{48}$

$\frac{48}{16} = \frac{16n}{16}$

$n = 3$ in.

25. $\frac{1}{16} = \frac{n}{8}$

$\frac{8}{16} = \frac{16n}{16}$

$n = 0.5$ in.

26. $\frac{1}{16} = \frac{n}{67.2}$

$\frac{67.2}{16} = \frac{16n}{16}$

$n = 4.2$ in.

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1. $\frac{0}{10}$ $\frac{1}{10}$ $\frac{2}{10}$ $\frac{3}{10}$ $\frac{4}{10}$ $\frac{5}{10}$ $\frac{6}{10}$ $\frac{7}{10}$ $\frac{8}{10}$ $\frac{9}{10}$ 1

0%   40%   100%

2. $\frac{0}{10}$ $\frac{1}{10}$ $\frac{2}{10}$ $\frac{3}{10}$ $\frac{4}{10}$ $\frac{5}{10}$ $\frac{6}{10}$ $\frac{7}{10}$ $\frac{8}{10}$ $\frac{9}{10}$ 1

0%   70%   100%

3. $\frac{0}{10}$ $\frac{1}{10}$ $\frac{2}{10}$ $\frac{3}{10}$ $\frac{4}{10}$ $\frac{5}{10}$ $\frac{6}{10}$ $\frac{7}{10}$ $\frac{8}{10}$ $\frac{9}{10}$ 1

0%   85% 100%

13.

14.

15.
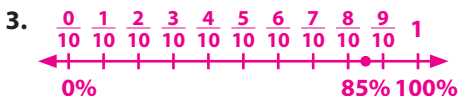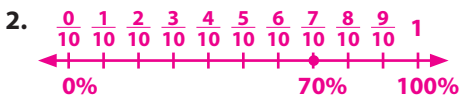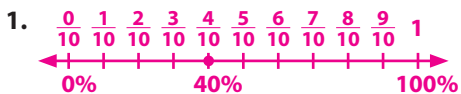
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1. $\frac{50}{100} \times 78 = 39$

2. $\frac{30}{100} \times 80 = \frac{120}{5} = 24$

3. $\frac{40}{100} \times 200 = 80$

4. $\frac{25}{100} \times 48 = 12$

5. $\frac{60}{100} \times 25 = 15$

6. $\frac{75}{100} \times 52 = 39$

7. $\frac{20}{100} \times 85 = 17$

8. $\frac{33}{100} \times 100 = 33$

9. $\frac{10}{100} \times 250 = 25$

10. $\frac{70}{100} \times 15 = 10.5$ or $10\frac{1}{2}$

11. $0.15 \times 80 = 12$

12. $0.35 \times 120 = 42$

13. $0.24 \times 400 = 96$

14. $0.05 \times 64 = 3.2$

15. $1.0 \times 25 = 25$

16. $0.18 \times 65 = 11.7$

17. $0.52 \times 65 = 33.8$

18. $0.39 \times 200 = 78$

19. $0.99 \times 50 = 49.5$

20. $0.45 \times 20 = 9$

21.

10% of 70 = 7
20% = 2 × 7 = 14
80% = 8 × 7 = 56

22.

10% of 50 = 5
40% = 4 × 5 = 20
90% = 9 × 5 = 45

23.

0 ... 85

10% 10% 10% 10% 10% 10% 10% 10% 10% 10%
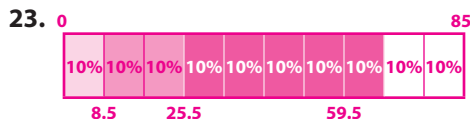
8.5   25.5   59.5

10% of 85 = 8.5
30% = 3 × 8.5 = 25.5
70% = 7 × 8.5 = 59.5

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33. $\frac{5}{100} = \frac{n}{24}$; $n = 1.2$ **hours**

34. $\frac{35}{100} = \frac{n}{40}$; $n = 14$ **shots**

35. $\frac{25}{100} = \frac{n}{\$64}$; $n = \$16$;
$\$64 - \$16 = \$48$

36. $\frac{8}{100} = \frac{n}{\$37.50}$; $n = \$3.00$

37. $\frac{20}{100} = \frac{n}{\$60}$; $n = \$12$

38. $\frac{10}{100} = \frac{n}{\$80}$; $n = \$8$;
$\frac{40}{100} = \frac{n}{\$80}$; $n = \$32$

39. $\frac{2}{100} = \frac{n}{\$150}$; $n = \$3$

40. $\frac{65}{100} = \frac{n}{200}$; $n = 130$ **people**

41. $\frac{80}{100} = \frac{n}{6}$; $n = 4.8$ **feet**

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1. $15\% \cdot n = 12$

$\frac{0.15n}{0.15} = \frac{12}{0.15}$

$n = 80$

2. $20\% \cdot n = 50$

$\frac{0.20n}{0.20} = \frac{50}{0.20}$

$n = 250$

3. $60\% \cdot n = 15$

$\frac{0.60n}{0.60} = \frac{15}{0.60}$

$n = 25$

4. $75\% \cdot n = 9$

$\frac{0.75n}{0.75} = \frac{9}{0.75}$

$n = 12$

5. $16 = 25\% \cdot n$

$\frac{16}{0.25} = \frac{0.25n}{0.25}$

$n = 64$

6. $14 = 35\% \cdot n$

$\frac{14}{0.35} = \frac{0.35n}{0.35}$

$n = 40$

7. $\frac{35}{100} = \frac{42}{n}$

$\frac{35n}{35} = \frac{4,200}{35}$

$n = 120$

8. $\frac{60}{100} = \frac{24}{n}$

$\frac{60n}{60} = \frac{2,400}{60}$

$n = 40$

9. $\frac{52}{100} = \frac{78}{n}$

$\frac{52n}{52} = \frac{7,800}{52}$

$n = 150$

10. $\frac{3}{100} = \frac{6}{n}$

$\frac{3n}{3} = \frac{600}{3}$

$n = 200$

11. $\frac{14}{100} = \frac{7}{n}$

$\frac{14n}{14} = \frac{700}{14}$

$n = 50$
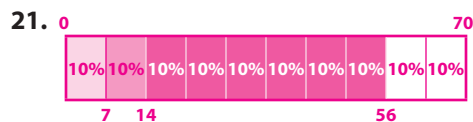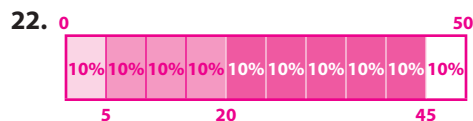
12. $\frac{45}{100} = \frac{36}{n}$

$\frac{45n}{45} = \frac{3,600}{45}$

$n = 80$

13.

2   4   6   8 ... n

40%
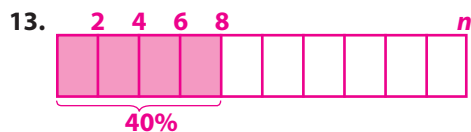
40% · n = 8
8 ÷ 4 = 2; Each part is 2.
100% = 10 · 2 = 20
n = 20
40% · 20 = 8

14.

7   14   28 ... 56 n

80%
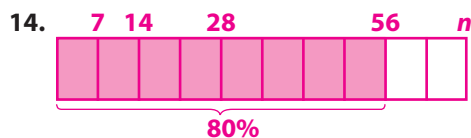
80% · n = 56
56 ÷ 8 = 7; Each part is 7.
100% = 10 · 7 = 70
n = 70
80% · 70 = 56

15.
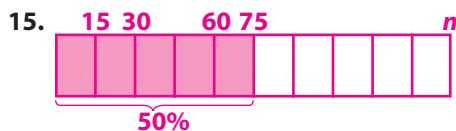
$$50\% \cdot n = 75$$
$$75 \div 5 = 15; \text{ Each part is 15.}$$
$$100\% = 10 \cdot 15 = 150$$
$$n = 150$$
$$50\% \cdot 150 = 75$$

16.

$$70\% \cdot n = 84$$
$$84 \div 7 = 12; \text{ Each part is 12.}$$
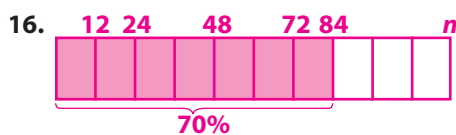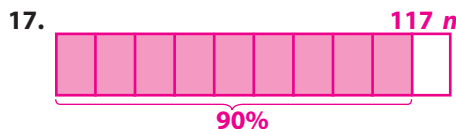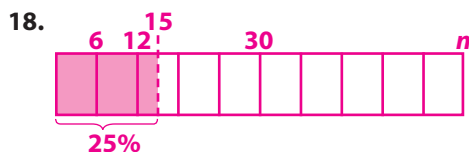$$100\% = 10 \cdot 12 = 120$$
$$n = 120$$
$$70\% \cdot 120 = 84$$

17.

$$117 = 90\% \cdot n$$
$$117 \div 9 = 13; \text{ Each part is 13.}$$
$$100\% = 10 \cdot 13 = 130$$
$$n = 130$$
$$90\% \cdot 130 = 117$$

18.

$$15 = 25\% \cdot n$$
$$15 \div 2\frac{1}{2} = 15 \cdot \frac{2}{5} = 6; \text{ Each part is 6.}$$
$$100\% = 10 \cdot 6 = 60$$
$$n = 60$$
$$25\% \cdot 60 = 15$$

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34. $\frac{4}{6} = \frac{5}{d}; d = 7.5 \text{ hr}$

35. $\frac{240}{2} = \frac{m}{5}; m = 600 \text{ mi}$

36. $\frac{1}{3} \cdot \$45 = \frac{45}{3} = \$15$
$$\$45 - \$15 = \$30$$

37. $\frac{8}{100} = \frac{t}{\$6.50}; t = \$0.52$

38. $\frac{35}{100} = \frac{d}{24}; d = 8.4 \text{ hr}$

39. $\frac{30}{100} = \frac{\$12}{b}; b = \$40$

40. $\frac{20}{100} = \frac{2}{g}; g = 10 \text{ goals}$

41. $\frac{2}{1} = \frac{v}{8}; v = 16 \text{ votes}$

42. $\frac{6}{8} = \frac{n}{28}; n = 21 \text{ ft}$

43. $\frac{1}{3} = \frac{n}{12}; n = 4 \text{ m}$

44. $\frac{29}{33} = \frac{n}{100}; n \approx 88\%$

45. $\frac{20}{100} = \frac{n}{\$65}; n = \$13$
$$\frac{45}{100} = \frac{s}{\$65}; s = \$29.25$$
$$\$65.00 - \$29.25 = \$35.75$$

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1. $\frac{4 \text{ mi}}{1 \text{ hr}} = \frac{n \text{ mi}}{2 \text{ hr}}$
$$n = 2 \cdot 4 \text{ mi}$$
$$n = 8 \text{ mi}$$

2. $\frac{52 \text{ km}}{1 \text{ hr}} = \frac{n \text{ km}}{5 \text{ hr}}$
$$n = 5 \cdot 52 \text{ km}$$
$$n = 260 \text{ km}$$

3. $\frac{7 \text{ ft}}{1 \text{ sec}} = \frac{n \text{ ft}}{12 \text{ sec}}$
$$n = 12 \cdot 7 \text{ ft}$$
$$n = 84 \text{ ft}$$

4. $\frac{3 \text{ mi}}{1 \text{ hr}} = \frac{5 \text{ mi}}{n \text{ hr}}$
$$\frac{3n}{3} = \frac{5}{3}$$
$$n \approx 1.67 \text{ hr}$$

5. $\frac{50 \text{ mi}}{1 \text{ hr}} = \frac{200 \text{ mi}}{n \text{ hr}}$
$$\frac{50n}{50} = \frac{200}{50}$$
$$n = 4 \text{ hr}$$

6. $\frac{330 \text{ mi}}{1 \text{ hr}} = \frac{165 \text{ mi}}{n \text{ hr}}$
$$\frac{330n}{330} = \frac{165}{330}$$
$$n = 0.5 \text{ hr}$$

7. $\frac{224 \text{ km}}{3.5 \text{ hr}} = \frac{n \text{ km}}{1 \text{ hr}}$
$$n = \frac{64 \text{ km}}{\text{hr}}$$

8. $\frac{140 \text{ mi}}{4 \text{ hr}} = \frac{n \text{ mi}}{1 \text{ hr}}$
$$n = \frac{35 \text{ mi}}{\text{hr}}$$

9. $\frac{270 \text{ mi}}{3 \text{ hr}} = \frac{n \text{ mi}}{1 \text{ hr}}$
$$n = \frac{90 \text{ mi}}{\text{hr}}$$

10. $\frac{350 \text{ mi}}{1 \text{ hr}} = \frac{d}{2.25 \text{ hr}}$
$$d = 787.5 \text{ mi}$$

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Math 6, Solutions

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11. $\dfrac{340\text{ mi}}{1\text{ hr}} = \dfrac{1{,}190\text{ mi}}{t}$

$\dfrac{340t}{340} = \dfrac{1{,}190}{340}$

$t = 3.5\text{ hr}$

12. $\dfrac{12\text{ mi}}{1\text{ hr}} = \dfrac{24\text{ mi}}{t}$

$\dfrac{12t}{12} = \dfrac{24}{12}$

$t = 2\text{ hr}$

13. $\dfrac{50\text{ mi}}{1\text{ hr}} = \dfrac{600\text{ mi}}{t}$ 　 $\dfrac{60\text{ mi}}{1\text{ hr}} = \dfrac{600\text{ mi}}{t}$

$\dfrac{50t}{50} = \dfrac{600}{50}$ 　　 $\dfrac{60t}{60} = \dfrac{600}{60}$

$t = 12\text{ hr}$ 　　　 $t = 10\text{ hr}$

$12 - 10 = 2\text{ hr}$

(14) $1\text{ hr} = 60\text{ min}$ 　 $\dfrac{25\text{ mi}}{60\text{ min}} = \dfrac{5\text{ mi}}{t}$

$\dfrac{30\text{ mi}}{60\text{ min}} = \dfrac{5\text{ mi}}{t}$ 　 $25t = 5 \cdot 60$

$30t = 5 \cdot 60$ 　　 $\dfrac{25t}{25} = \dfrac{300}{25}$

$\dfrac{30t}{30} = \dfrac{300}{30}$ 　　 $t = 12\text{ min}$

$t = 10\text{ min}$

$12 - 10 = 2\text{ min}$

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15. $1\text{ hr} = 60\text{ min}$

$\dfrac{50\text{ mi}}{60\text{ min}} = \dfrac{d}{60\text{ min}}$

$60 \cdot 50 = 60d$

$\dfrac{3{,}000}{60} = \dfrac{60d}{60}$

$d = 50\text{ mi}$

16. $20\text{ yd} = 60\text{ ft}$

$\dfrac{5\text{ ft}}{1\text{ min}} = \dfrac{60\text{ ft}}{t}$

$\dfrac{5t}{5} = \dfrac{60}{5}$

$t = 12\text{ min}$

17. $\dfrac{\frac{1}{2}\text{ mi}}{1\text{ hr}} = \dfrac{d}{5\text{ hr}}$

$5 \cdot \dfrac{1}{2} = d$

$d = \dfrac{5}{2} = 2\dfrac{1}{2}\text{ mi}$

18. $\dfrac{0.5\text{ mi}}{5\text{ min}} = \dfrac{n}{1\text{ min}}$

$\dfrac{0.5}{5} = \dfrac{5n}{5}$

$n = 0.1\text{ mi}$

19. $3\text{ km} = 3000\text{ m}$

$\dfrac{250\text{ m}}{1\text{ min}} = \dfrac{3000\text{ m}}{t}$

$\dfrac{250t}{250} = \dfrac{3000}{250}$

$t = 12\text{ min}$

20. $\dfrac{1}{2}\text{ day} = 12\text{ hr}$

$\dfrac{540\text{ mi}}{12\text{ hr}} = \dfrac{r}{1\text{ hr}}$

$\dfrac{540\text{ mi}}{12} = \dfrac{12r}{12}$

$r = 45\text{ mi/hr}$

21. $\dfrac{21\text{ ft}}{1\text{ sec}} = \dfrac{d}{15\text{ sec}}$

$21 \cdot 15 = d$

$d = 315\text{ ft}$

22. $1\text{ day} = 24\text{ hr}$

$\dfrac{600\text{ mi}}{24\text{ hr}} = \dfrac{r}{1\text{ hr}}$

$\dfrac{600}{24} = \dfrac{24r}{24}$

$r = 25\text{ mi/hr}$

23. $1\text{ mi} = 5{,}280\text{ ft}$

$\dfrac{40\text{ ft}}{1\text{ sec}} = \dfrac{5{,}280\text{ ft}}{t}$

$\dfrac{40t}{40} = \dfrac{5{,}280}{40}$

$t = 132\text{ sec}$

24. $1\text{ hr} = 60\text{ min}$

$\dfrac{70\text{ km}}{60\text{ min}} = \dfrac{d}{30\text{ min}}$

$70 \cdot 30 = 60d$

$\dfrac{2100}{60} = \dfrac{60d}{60}$

$d = 35\text{ km}$

25. $\dfrac{66\text{ ft}}{1\text{ min}} = \dfrac{d}{15\text{ min}}$

$66 \cdot 15 = d$

$d = 990\text{ ft}$

$\dfrac{66\text{ ft}}{1\text{ min}} = \dfrac{5{,}280\text{ ft}}{t}$

$\dfrac{66t}{66} = \dfrac{5{,}280}{66}$

$t = 80\text{ min}$

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5. $\dfrac{510\text{ mi}}{17\text{ gal}} = \dfrac{m}{1\text{ gal}}$

$\dfrac{510}{17} = \dfrac{17m}{17}$

$m = 30\text{ mi/gal (or mpg)}$

6. $\dfrac{\$56.00}{8\text{ hr}} = \dfrac{n}{1\text{ hr}}$

$\dfrac{\$56.00}{8} = \dfrac{8n}{8}$

$n = \$7.00/\text{hr}$

7. $\dfrac{30\text{ pg}}{20\text{ min}} = \dfrac{n}{1\text{ min}}$

$\dfrac{30}{20} = \dfrac{20n}{20}$

$n = 1.5\text{ pg/min}$

8. $\dfrac{\$4.25}{5\text{ lb}} = \dfrac{n}{1\text{ lb}}$

$\dfrac{\$4.25}{5} = \dfrac{5n}{5}$

$n = \$0.85/\text{lb}$

9. $\frac{15 \text{ yd}}{1 \text{ min}} = \frac{r}{4 \text{ min}}$

$4 \cdot 15 \text{ yd} = r$

$r = 60 \text{ yd}$

10. $\frac{50 \text{ mi}}{1 \text{ hr}} = \frac{r}{3.5 \text{ hr}}$

$3.5 \cdot 50 \text{ mi} = r$

$r = 175 \text{ mi}$

11. $\frac{20 \text{ ft}}{1 \text{ sec}} = \frac{r}{18 \text{ sec}}$

$18 \cdot 20 \text{ ft} = r$

$r = 360 \text{ ft}$

12. $\frac{21 \text{ mi}}{1 \text{ day}} = \frac{r}{6 \text{ days}}$

$6 \cdot 21 \text{ mi} = r$

$r = 126 \text{ mi}$

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35. $5\% \cdot n = 3$

$\frac{0.05n}{0.05} = \frac{3}{0.05}$

$n = 60$

36. $40\% \cdot n = 32$

$\frac{0.4n}{0.4} = \frac{32}{0.4}$

$n = 80$

37. $25\% \cdot n = 5$

$\frac{0.25n}{0.25} = \frac{5}{0.25}$

$n = 20$

38. $\frac{84}{124} = \frac{n}{10}$

$\frac{840}{124} = \frac{124n}{124}$

$n \approx 7 \text{ students}$

39. $\frac{18 \text{ items}}{15 \text{ hrs}} = \frac{12 \text{ items}}{t}$

$\frac{18t}{18} = \frac{180}{18}$

$t = 10 \text{ hr}$

40. $\frac{12 \text{ ft}}{2 \text{ in.}} = \frac{144 \text{ ft}}{n}$

$\frac{12n}{12} = \frac{288}{12}$

$n = 24 \text{ in}$

41. $10\% \cdot \$200 =$

$0.10 \cdot \$200 = \$20 \text{ to church}$

$40\% \cdot \$200 =$

$0.40 \cdot \$200 = \$80 \text{ to savings}$

42. $3\% \cdot \$500 =$

$0.03 \cdot \$500 = \$15.00$

43. $85\% \cdot 200 =$

$0.85 \cdot 200 = 170 \text{ people}$

44. $\frac{2}{4} = \frac{10}{n}$

$2n = 4 \cdot 10$

$\frac{2n}{2} = \frac{40}{2}$

$n = 20 \text{ in.}$

45. $\frac{42}{50} = \frac{n}{100}$

$100 \cdot 42 = 50n$

$\frac{4,200}{50} = \frac{50n}{50}$

$n = 84; 84\%$

46. $25\% \cdot \$45 =$

$0.25 \cdot \$45 = \$11.25 \text{ discount}$

$\$45.00 - \$11.25 = \$33.75 \text{ cost}$

47. $7\% \cdot \$11 =$

$0.07 \cdot \$11 = \$0.77$

48. $30\% \cdot n = \$21$

$\frac{0.30n}{0.30} = \frac{\$21}{0.30}$

$n = \$70$

49. $3 = 60\% \cdot n$

$\frac{3}{0.60} = \frac{0.60n}{0.60}$

$n = 5 \text{ attempts}$

Chapter 14

page 304

8. $5 \times 36 = 180$

9. $12 \div 3 = 4$

10. $2 \times 5,280 = 10,560$

11. $108 \div 36 = 3$

12. $3 \times \frac{5}{3} = \frac{15}{3} = 5$

or $3 \text{ ft} + 2 \text{ ft} = 5 \text{ ft}$

13. $117 \div 36 = 3\frac{9}{36} = 3\frac{1}{4}$

14. $30 \div 12 = 2\frac{6}{12} = 2\frac{1}{2}$

15. $7 \div 3 = 2 \text{ r}1$

16. $(6 \cdot 12) + 6 = 78$

17. $5,290 \div 5,280 = 1 \text{ r}10$

18. $\frac{3}{4} \cdot 36 = 27$

19. $\frac{2}{3} \cdot 12 = 8$

20. $\frac{1}{4} \cdot 5,280 = 1,320 \text{ ft}$

21. $\frac{3}{4} \cdot 12 = 9$

22. $\frac{2}{3} \cdot 5{,}280 = 3{,}520$

23. $\frac{1}{9} \cdot 36 = 4$

24. $\frac{1}{2} \cdot 36 = 18$

25. $\frac{1}{2} \cdot 5{,}280 = 2{,}640$

26. $\frac{2{,}640}{1{,}760} = 1\frac{1}{2}$

27. $82 \div 12 = 6\frac{5}{6}$

page 306

9. $6 \cdot 16 = 96$

10. $(6 \cdot 16) + 9 =$
$96 + 9 = 105$

11. $(2 \cdot 2{,}000) + 25 =$
$4{,}000 + 25 = 4{,}025$

12. $3 \cdot 2{,}000 = 6{,}000$

13. $(12 \cdot 16) + 9 =$
$192 + 9 = 201$

14. $9 \div 2 = 4 \text{ r}1$

15. $(4 \cdot 16) + 2 =$
$64 + 2 = 66$

16. $10 \div 4 = 2 \text{ r}2$

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17. $\frac{1}{2} \cdot 2{,}000 = 1{,}000$

18. $\frac{5}{8} \cdot 16 = 10$

19. $\frac{3}{4} \cdot 4 = 3$

20. $\frac{3}{8} \cdot 8 = 3$

21. $\frac{1}{2} \cdot 16 = 8$

22. $\frac{1}{4} \cdot 2{,}000 = 500$

23. $\frac{3}{4} \cdot 8 = 6$

24. $\frac{1}{2} \cdot 4 = 2$

25. $3\frac{1}{2} \cdot 2 = \frac{7}{2} \cdot 2 = 7$

26. $1\frac{1}{2} \cdot 16 = \frac{3}{2} \cdot 16 = 24$

27. $10\frac{1}{4} \cdot 2{,}000 = \frac{41}{4} \cdot 2{,}000 = 20{,}500$

28. $3\frac{1}{2} \cdot 4 = \frac{7}{2} \cdot 4 = 14$

44. $\frac{3}{4} \cdot 16 = 12 \text{ oz}$

45. $(2\frac{1}{4} \cdot 12) - 21 =$
$(\frac{9}{4} \cdot 12) - 21 =$
$27 - 21 = 6 \text{ in. or } \frac{1}{2} \text{ ft}$

page 308

16. $2 \cdot 100 = 200$

17. $423 \div 100 = 4.23$

18. $\frac{1}{2} \cdot 1000 = 500$

19. $780 \div 100 = 7.8$

20. $3000 \div 1000 = 3$

21. $\frac{1}{4} \cdot 100 = 25$

22. $5 \cdot 1000 = 5000$

23. $6500 \div 1000 = 6.5$

24. $\frac{2}{5} \cdot 10 = 4$

25. $2100 \div 1000 = 2.1$

26. $3.76 \cdot 100 = 376$

27. $\frac{3}{4} \cdot 100 = 75$

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18. $3 \cdot 1000 = 3000$

19. $2000 \div 1000 = 2$

20. $8000 \div 1000 = 8$

21. $5700 \div 1000 = 5.7$

22. $7.1 \cdot 1000 = 7100$

23. $9500 \div 1000 = 9.5$

24. $4.5 \cdot 1000 = 4500$

25. $2430 \div 1000 = 2.43$

26. $2.75 \cdot 1000 = 2750$

17.
$$
\begin{array}{r}
\underline{16.2} \\
3\overline{)48.6} \\
\underline{-3} \\
18 \\
\underline{-18} \\
06 \\
\underline{-\ 6} \\
0
\end{array}
$$

18.
$$
\begin{array}{r}
\underline{4\ \text{ft}\ 2\ \text{in.}} \\
4\overline{)16\ \text{ft}\ \ 8\ \text{in.}} \\
\underline{-16\ \text{ft}} \\
0\ \text{ft}\ \ 8\ \text{in.} \\
\underline{-\qquad 8\ \text{in.}} \\
0
\end{array}
$$

19.
$$
\begin{array}{r}
\underline{3\ \text{tn}\ 105\ \text{lb}} \\
2\overline{)6\ \text{tn}\ \ 210\ \text{lb}} \\
\underline{-6\ \text{tn}} \\
0\ \text{tn}\ \ 2 \\
\underline{-\qquad 2} \\
010 \\
\underline{-\ 10} \\
0
\end{array}
$$

20.
$$
\begin{array}{r}
\underline{6\ \text{gal}\ 3\ \text{pt}} \\
3\overline{)18\ \text{gal}\ \ 9\ \text{pt}} \\
\underline{-18\ \text{gal}} \\
0\ \text{gal}\ \ 9\ \text{pt} \\
\underline{-\qquad 9\ \text{pt}} \\
0
\end{array}
$$

15. $C = \frac{5}{9} \cdot (F - 32°)$

$C = \frac{5}{9} \cdot (59° - 32°)$

$C = \frac{5}{9} \cdot 27$

$C = \frac{5}{9} \cdot \frac{27}{1}$

$C = 15°$

16. $C = \frac{5}{9} \cdot (F - 32°)$

$C = \frac{5}{9} \cdot (41° - 32°)$

$C = \frac{5}{9} \cdot 9$

$C = \frac{5}{9} \cdot \frac{9}{1}$

$C = 5°$

17. $C = \frac{5}{9} \cdot (F - 32°)$

$C = \frac{5}{9} \cdot (95° - 32°)$

$C = \frac{5}{9} \cdot 63$

$C = \frac{5}{9} \cdot \frac{63}{1}$

$C = 35°$

18. $F = (\frac{9}{5} \cdot C) + 32°$

$F = (\frac{9}{5} \cdot 10°) + 32°$

$F = (\frac{9}{5} \cdot \frac{10}{1}) + 32°$

$F = 18° + 32°$

$F = 50°$

19. $F = (\frac{9}{5} \cdot C) + 32°$

$F = (\frac{9}{5} \cdot 20) + 32°$

$F = (\frac{9}{5} \cdot \frac{20}{1}) + 32°$

$F = 36° + 32°$

$F = 68°$

20. $F = (\frac{9}{5} \cdot C) + 32°$

$F = (\frac{9}{5} \cdot 50) + 32°$

$F = (\frac{9}{5} \cdot \frac{50}{1}) + 32°$

$F = 90° + 32°$

$F = 122°$

21. $F = (\frac{9}{5} \cdot 15°) + 32°$

$F = (\frac{9}{5} \cdot \frac{15}{1}) + 32°$

$F = 27° + 32°$

$F = 59°$

17. $\frac{36\ \text{in.}}{1\ \text{yd}}$ or $\frac{1\ \text{yd}}{36\ \text{in.}}$

$\frac{7\ \text{yd}}{1} \cdot \frac{36\ \text{in.}}{1\ \text{yd}} = 252\ \text{in.}$

18. $\frac{16\ \text{oz}}{1\ \text{lb}}$ or $\frac{1\ \text{lb}}{16\ \text{oz}}$

$\frac{64\ \text{oz}}{1} \cdot \frac{1\ \text{lb}}{16\ \text{oz}} = 4\ \text{lb}$

19. $\frac{4\ \text{qt}}{1\ \text{gal}}$ or $\frac{1\ \text{gal}}{4\ \text{qt}}$

$\frac{8\ \text{gal}}{1} \cdot \frac{4\ \text{qt}}{1\ \text{gal}} = 32\ \text{qt}$

20. $\frac{60\ \text{min}}{1\ \text{hr}}$ or $\frac{1\ \text{hr}}{60\ \text{min}}$

$\frac{3\ \text{hr}}{1} \cdot \frac{60\ \text{min}}{1\ \text{hr}} = 180\ \text{min}$

21. $\frac{1000\ \text{g}}{1\ \text{kg}}$ or $\frac{1\ \text{kg}}{1000\ \text{g}}$

$\frac{3\ \text{kg}}{1} \cdot \frac{1000\ \text{g}}{1\ \text{kg}} = 3000\ \text{g}$

22. $\frac{1000\ \text{mL}}{1\ \text{L}}$ or $\frac{1\ \text{L}}{1000\ \text{mL}}$

$\frac{2500\ \text{mL}}{1} \cdot \frac{1\ \text{L}}{1000\ \text{mL}} = 2.5\ \text{L}$

23. $\frac{100\ \text{cm}}{1\ \text{m}}$ or $\frac{1\ \text{m}}{100\ \text{cm}}$

$\frac{450\ \text{cm}}{1} \cdot \frac{1\ \text{m}}{100\ \text{cm}} = 4.5\ \text{m}$

24. $\frac{8\ \text{oz}}{1\ \text{c}}$ or $\frac{1\ \text{c}}{8\ \text{oz}}$

$\frac{3\ \text{c}}{1} \cdot \frac{8\ \text{oz}}{1\ \text{c}} = 24\ \text{oz}$

25. $\frac{5\ \text{tn}}{1} \cdot \frac{2000\ \text{lb}}{1\ \text{tn}} = 10{,}000\ \text{lb}$

26. $\frac{13\ \text{gal}}{1} \cdot \frac{4\ \text{qt}}{1\ \text{gal}} = 52\ \text{qt}$

27. $\frac{20\ \text{c}}{1} \cdot \frac{1\ \text{pt}}{2\ \text{c}} = 10\ \text{pt}$

28. $\dfrac{8 \text{ mi}}{1} \cdot \dfrac{1760 \text{ yd}}{1 \text{ mi}} = 14{,}080 \text{ yd}$

29. $\dfrac{108 \text{ in.}}{1} \cdot \dfrac{1 \text{ ft}}{12 \text{ in.}} = 9 \text{ ft}$

30. $\dfrac{120 \text{ oz}}{1} \cdot \dfrac{1 \text{ c}}{8 \text{ oz}} = 15 \text{ c}$

31. $\dfrac{4 \text{ yd}}{1} \cdot \dfrac{36 \text{ in.}}{1 \text{ yd}} = 144 \text{ in.}$

32. $\dfrac{128 \text{ oz}}{1} \cdot \dfrac{1 \text{ lb}}{16 \text{ oz}} = 8 \text{ lb}$

Chapter 15

page 334

6. mean: $[(2 \cdot 10) + (4 \cdot 11) + (3 \cdot 12) + (2 \cdot 13) + (2 \cdot 14)] \div 13 = 154 \div 13 \approx 11.8$
median: 10 10 11 11 11 11 ⑫ 12 12 13 13 14 14

7–9. See frequency table on page 58.

8. mean: $(83 + 81 + 86 + 88 + 80 + 82 + 85) \div 7 = 585 \div 7 \approx 83.6$

9. median: 80 81 82 ㉃ 85 86 88;
$83° < 83.6°$

page 335

14. mean: The sum of the data is 499;
$499 \div 6 \approx 83.2$
median: 79 81 ⟨82 85⟩ 85 87

15. mean: The sum of the data is 232;
$232 \div 5 = 46.4$
median: 40 41 ㊽ 51 52

16. mean: The sum of the data is 115;
$115 \div 8 \approx 14.4$
median: 10 12 12 ⟨12 15⟩ 17 18 19

17. mean: $14 + 11 + 10 + 24 = 59$ chairs

25. $4(6 \text{ ft} \cdot 3 \text{ ft}) + 2(3 \text{ ft} \cdot 3 \text{ ft}) =$
$4 \cdot 18 \text{ ft}^2 + 2 \cdot 9 \text{ ft}^2 =$
$72 \text{ ft}^2 + 18 \text{ ft}^2 = 90 \text{ ft}^2$

26. $6 \text{ ft} \cdot 3 \text{ ft} \cdot 3 \text{ ft} = 54 \text{ ft}^3$

page 336

7. mean for Maria: $(30 + 90 + 15 + 75 + 45) \div 5 = 255 \div 5 = 51$ min
mean for Mitchell: $(15 + 90 + 30 + 60 + 60) \div 5 = 255 \div 5 = 51$ min

9. median for Mitchell: 15 30 ㊿ 60 90
median for Maria: 15 30 ㊺ 75 90

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17. range: $5 - 1.5 = 3.5$ km
mean: $(1.5 + 2 + 3 + 3 + 4 + 5) \div 6 = 18.5 \div 6 \approx 3.1$ km

18. range: $4 - 1 = 3$ km
mean: $(1 + 2 + 2 + 1.5 + 3 + 4) \div 6 = 13.5 \div 6 \approx 2.3$ km

19. See line graph on page 58.

21. mean: The sum of the data is 1,120;
$1{,}120 \div 5 = 224$

Ⓙ See bar graph on page 58.
Each set of bars compares the morning and evening attendance at church.

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1–7. See stem and leaf plot on page 58.

8–15. See stem and leaf plot on page 58.

page 339

22. See line graph on page 58.

23. mean: The sum of the data is 2,645;
$2{,}645 \div 5 = 529$ calls

24. mean: The sum of the data is 2,650;
$2{,}650 \div 5 = 530$ calls

Ⓙ mean (average): the sum of the data divided by the number of addends
median: the middle value or an average of the two middle values of a set of data when ordered from least to greatest
mode: the value that occurs most often or has the greatest frequency. Some sets may have more than one mode, and some sets may not have a mode.

page 341

14–18. See line plot on page 59.

20. The sum of the data is 370; $370 \div 19 \approx 19.5$

26. $12 \div 19 = 0.63; \ 0.63 \times 100 = 63\%$

Ⓙ See line plot on page 59.
See line graph on page 59.

page 343

11–19. See histogram on page 59.

28. See double bar graph on page 59.

page 344

1–4. See box-and-whisker plot on page 59.

8–12. See box-and-whisker plot on page 59.

page 345

22. See box-and-whisker plot on page 60.

23. See box-and-whisker plot on page 60.

28. See histogram on page 60.

page 349

10. See box-and-whisker plot on page 60.

11. See box-and-whisker plot on page 60.

16. See histogram on page 60.

Chapter 16

page 358

17. $\frac{4}{6} = 0.\overline{6} \approx 0.67 = 67\%$

$\frac{2}{6} = 0.\overline{3} \approx 0.33 = 33\%$

18. $\frac{2}{6} = 0.\overline{3} \approx 0.33 = 33\%$

$\frac{4}{6} = 0.\overline{6} \approx 0.67 = 67\%$

19. $\frac{3}{6} = 0.5 = 50\%$

$\frac{3}{6} = 0.5 = 50\%$

20. $\frac{1}{6} = 0.1\overline{6} \approx 0.17 = 17\%$

$\frac{5}{6} = 0.8\overline{3} \approx 0.83 = 83\%$

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21. $\frac{1}{6} = 0.1\overline{6} \approx 0.17 = 17\%$

22. $\frac{2}{6} = \frac{1}{3} = 0.\overline{3} \approx 0.33 = 33\%$

23. $\frac{5}{6} = 0.8\overline{3} \approx 0.83 = 83\%$

24. $\frac{1}{6} = 0.1\overline{6} \approx 0.17 = 17\%$

25. $\frac{3}{6} = \frac{1}{2} = 0.50 = 50\%$

26. $\frac{3}{6} = \frac{1}{2} = 0.50 = 50\%$

27. $\frac{0}{6} = 0 = 0\%$

28. $\frac{4}{6} = \frac{2}{3} = 0.\overline{6} \approx 0.67 = 67\%$

29. $\frac{5}{6} = 0.8\overline{3} \approx 0.83 = 83\%$

30. $\frac{2}{6} = \frac{1}{3} = 0.\overline{3} \approx 0.33 = 33\%$

page 361

15. **2 sleeve lengths × 8 colors = 16 shirt choices**

16. **2 breads × 3 meats × 2 cheese = 12 sandwich choices**

17. **9 digits × 9 digits × 9 digits × 9 digits = 6,561 combinations**

18. **4 beds × 2 nightstands × 3 desks = 24 bedroom sets**

19. s < 2, 4   a < 2, 4
Sample Space: {s2, s4, a2, a4}
P(automatic transmission, 4-door) $= \frac{1}{4}$ or 25%

20.
Sample Space: {scs, scp, scc, svs, svp, svc, rcs, rcp, rcc, rvs, rvp, rvc}
P(cone with chocolate ice cream) $= \frac{6}{12} = \frac{1}{2}$; 50%

21.
Sample Space: {wr, wt, wb, br, bt, bb}
P(white or black car, black interior) $= \frac{2}{6} = \frac{1}{3}$; 33%

22.
Sample Space: {rbs, rbp, rks, rkp, obs, obp, oks, okp, gbs, gbp, gks, gkp}
P(red shirt, blue pants, solid sweatshirt) $= \frac{1}{12}$; 8%

23. (Note: T = thick; t = thin)
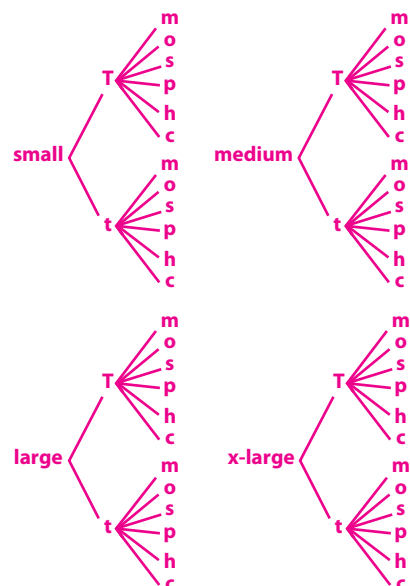
24. Sample Space: {sTm, sTo, sTs, sTp, sTh, sTc, stm, sto, sts, stp, sth, stc, mTm, mTo, mTs, mTp, mTh, mTc, mtm, mto, mts, mtp, mth, mtc, lTm, lTo, lTs, lTp, lTh, lTc, ltm, lto, lts, ltp, lth, ltc, xTm, xTo, xTs, xTp, xTh, xTc, xtm, xto, xts, xtp, xth, xtc}

25. $\frac{6}{48} = \frac{1}{8}$ or 13%

26. $\frac{1}{48}$ or 2%

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J

Genetic Survey Results (sample = 200 students)				
Trait	Dimples	Straight Hair	Attached Earlobes	Widow's Peak
Yes	80	100	60	100
No	120	100	140	100

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14. $P(\text{red}) = \{r, r, b, b, y, g\} = \frac{2}{6}$

$P(\text{yellow}) = \{r, b, b, y, g\} = \frac{1}{5}$

$\frac{2}{6} \times \frac{1}{5} = \frac{2}{30} = \frac{1}{15}$

15. $P(\text{yellow}) = \{r, r, b, b, y, g\} = \frac{1}{6}$

$P(\text{green}) = \{r, r, b, b, g\} = \frac{1}{5}$

$\frac{1}{6} \times \frac{1}{5} = \frac{1}{30}$

16. $P(\text{red}) = \{r, r, b, b, y, g\} = \frac{2}{6}$

$P(\text{not yellow}) = \{r, b, b, y, g\} = \frac{4}{5}$

$\frac{2}{6} \times \frac{4}{5} = \frac{8}{30} = \frac{4}{15}$

17. $P(\text{red}) = \{r, r, b, b, y, g\} = \frac{2}{6}$

$P(\text{blue}) = \{r, b, b, y, g\} = \frac{2}{5}$

$\frac{2}{6} \times \frac{2}{5} = \frac{4}{30} = \frac{2}{15}$

18. $P(\text{yellow}) = \{r, r, b, b, y, g\} = \frac{1}{6}$

$P(\text{blue}) = \{r, r, b, b, g\} = \frac{2}{5}$

$\frac{1}{6} \times \frac{2}{5} = \frac{2}{30} = \frac{1}{15}$

19. $P(\text{green}) = \{r, r, b, b, y, g\} = \frac{1}{6}$

$P(\text{not blue}) = \{r, r, b, b, y\} = \frac{3}{5}$

$\frac{1}{6} \times \frac{3}{5} = \frac{3}{30} = \frac{1}{10}$

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18.

Sample Space: {A1, A2, A3, B1, B2, B3}

$P(\text{B and an odd number}) = \frac{2}{6} = \frac{1}{3}$

19.

Sample Space: {A1, A2, A3, B1, B2, B3, C1, C2, C3}

$P(\text{A and an odd number}) = \frac{2}{9}$

20.

Sample Space: {A1, A2, A3, A4, A5, A6, B1, B2, B3, B4, B5, B6}

$P(\text{A and an even number}) = \frac{3}{12} = \frac{1}{4}$

21.

Sample Space: {rr, rb, br, bb}

$P(\text{blue and blue}) = \frac{1}{4}$

22.

Sample Space: {yy, yg, gy, gg}

$P(\text{yellow and yellow}) = \frac{1}{4}$

$P(\text{at least 1 green}) = \frac{3}{4}$

The game is unfair.

23. Sample Space: {1, 2, 3, 4, 5, 6}

$P(\text{is less than 4}) = \frac{3}{6} = \frac{1}{2}$

$P(\text{is greater than 3}) = \frac{3}{6} = \frac{1}{2}$
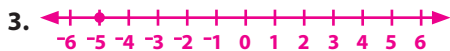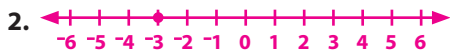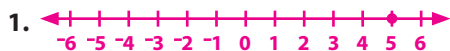
The game is fair.

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26–29.
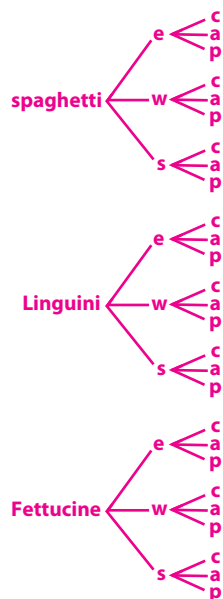
Sample Space: {sec, sea, sep, swc, swa, swp, ssc, ssa, ssp, lec, lea, lep, lwc, lwa, lwp, lsc, lsa, lsp, fec, fea, fep, fwc, fwa, fwp, fsc, fsa, fsp}
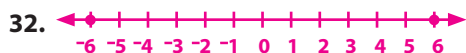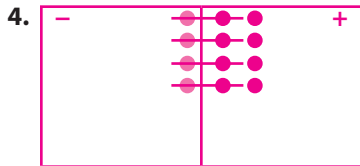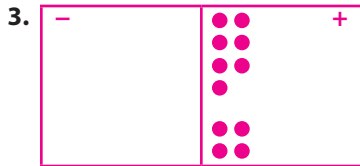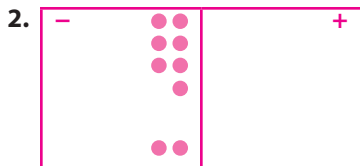
Chapter 17

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5.

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31.

32.

33.
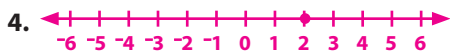
48. **12 • 12 = 144**

49. **8 • 8 • 8 = 512**

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27.

28.

29.

30.
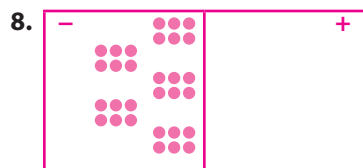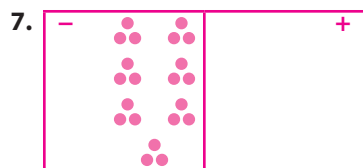
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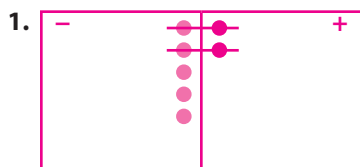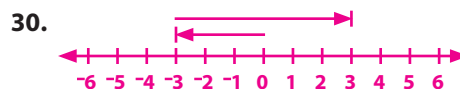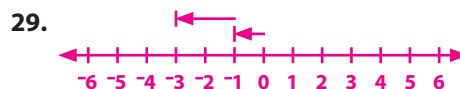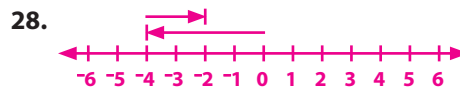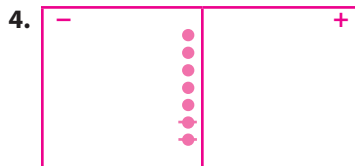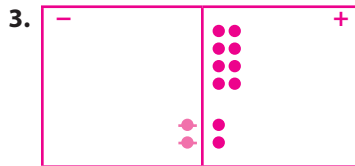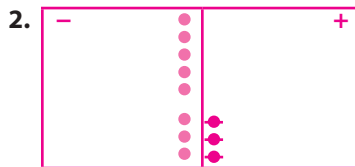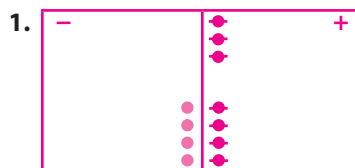
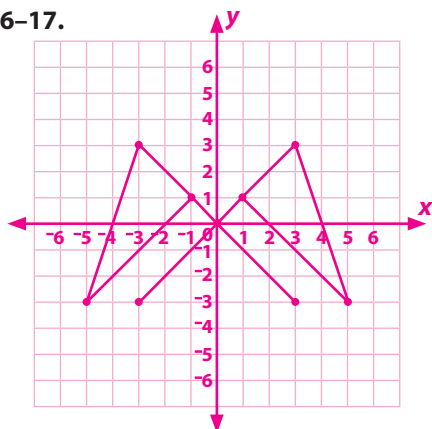**page 387**

27.
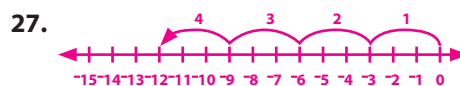
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5. **12 negative counters divided into 3 sets equals 4 negative counters in each set.**

6. **10 negative counters divided into equal sets of 5 negative counters will make 2 sets.**
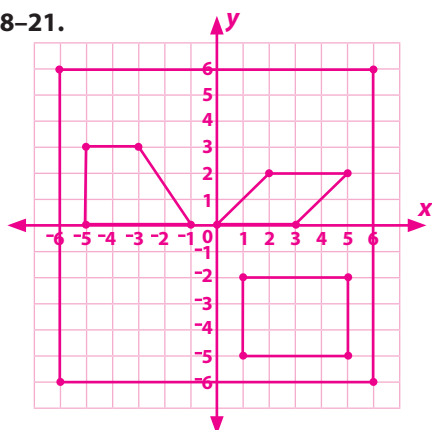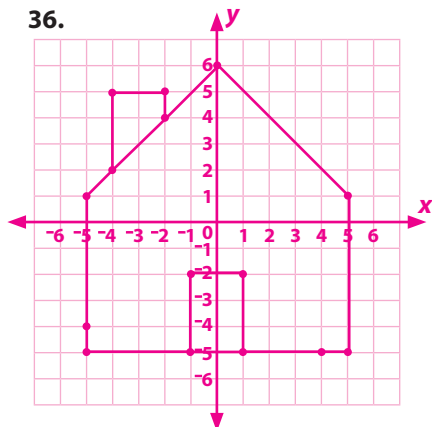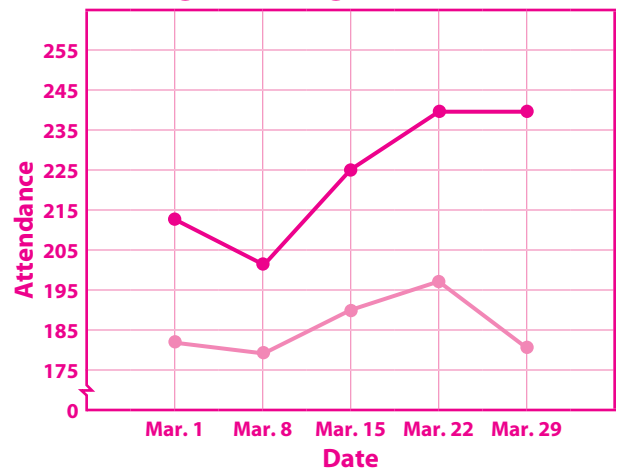
7.

8.

16–17.

18–21.

36.

page 334 #7–9.

High Temperature		
Temp	Tally	Frequency
80	I	1
81	I	1
82	I	1
83	I	1
84		
85	I	1
86	I	1
87		
88	I	1

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Morning & Evening Church Attendance

■ morning service
■ evening service

page 337 #19.

Morning & Evening Church Attendance

■ morning service
■ evening service
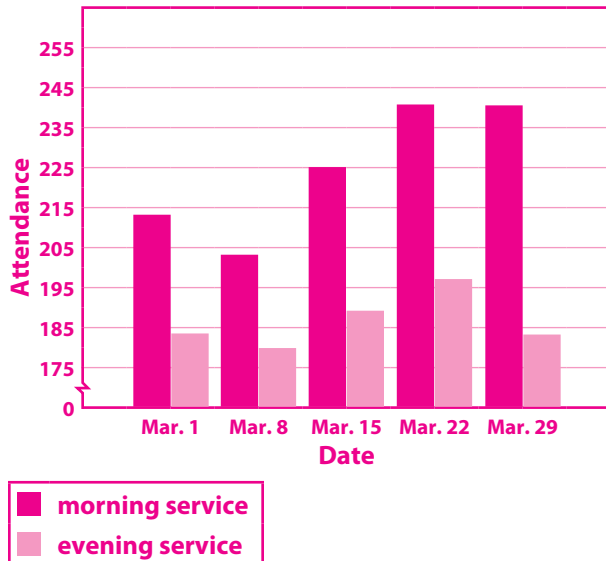
page 338 #1–7.

Number of Books Sold	
Stem	Leaf
0	9
1	0 2 4 5 8 9
2	0 1 1 3
3	0

Key 1|2 = 12

page 338 #8–15.

Ages of Missionaries	
Stem	Leaf
2	8
3	0 0 0 2 5 5 7 8 9
4	0 1 3 4 4
5	3 7
6	0 1

Key 2|8 = 28

page 339 #22.

Emergency Service Calls

■ Fox Hills Squad
■ Cool Springs Squad

page 341 #14–18.

16 17 18 19 20 21 22 23 24 25
Museum Visitors

page 341 J.

80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
Science Test Scores

Science Test Scores

Scores

Tests

page 343 #11–19.

History Test Scores

Number of Students

60–69   70–79   80–89   90–99
Score
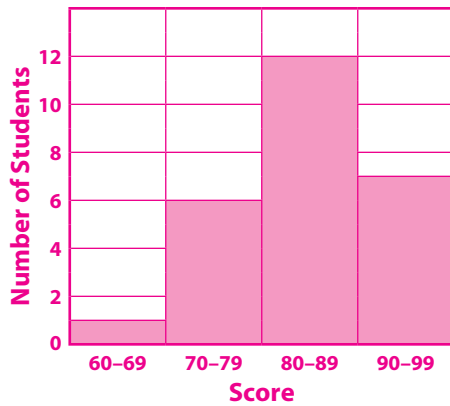
page 343 #28.

Percentage of Population Distribution

Percentage

United States   Iceland   South Africa   Colombia   Japan
Country

■ **urban population**
■ **rural population**

page 344 #1–4.

3 4 5 6 7 8 9 10 11 12 13 14 15

page 344 #8–12.

75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
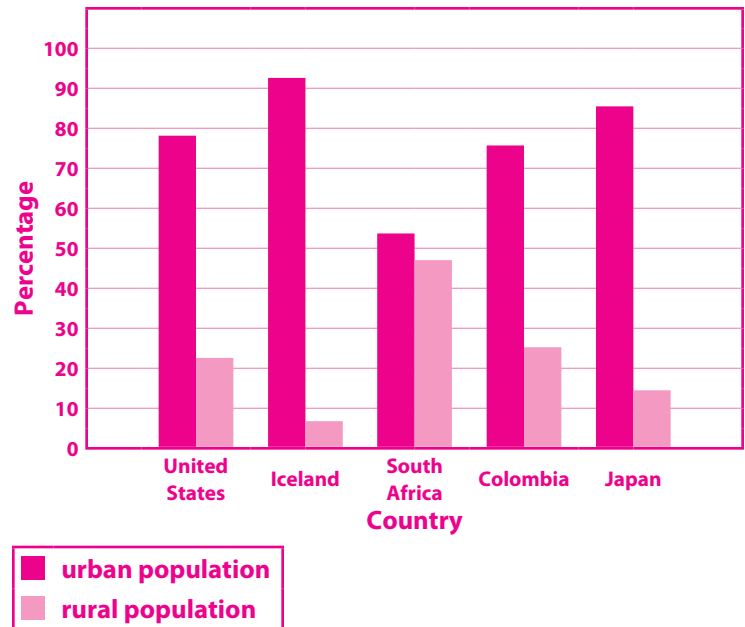
page 345 #22.

page 345 #23.

page 345 #28.

Miles Traveled to Church
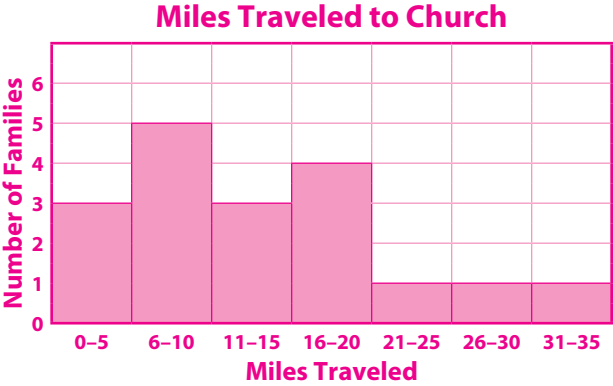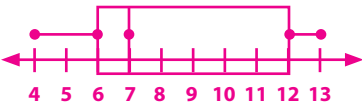
page 349 #10.
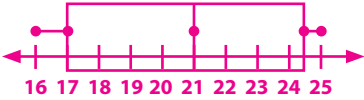
page 349 #11.

page 349 #16.   Vertical numbering may vary.

Ages Enrolled in Summer Swimming Lessons
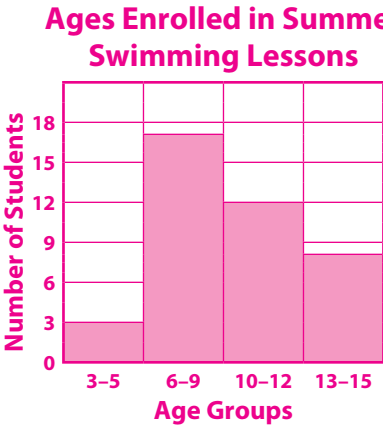
page 350 #1–5. Frequency table may vary.

Basketball Game Scores		
Score	**Tally**	**Frequency**
50–59	||||	4
60–69	||||	4
70–79	|	1