Complete Solutions Manual

Elementary Technical Mathematics

TWELFTH EDITION

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Table of Contents

Chapter 1: Basic Concepts

Section 1.1: Review of Basic Operations

1. 3255
2. $10,793$
3. 1454
4. 579
5. $795,776$
6. $4,845,000$
7. 5164
8. 3298
9. $26,008$
10. 130,130
11. 2820
12. 50,124
13. 4195Ω
14. 8615Ω
15. The sum of the lengths is 224 feet, so 224 studs are required.
16. $24 \text{ ft} - 4 \text{ ft} - 5 \text{ ft} - 7 \text{ ft} = 8 \text{ ft}$
17. 39 ft
18. $125 \text{ ft}^3 - 78 \text{ ft}^3 = 47 \text{ ft}^3$
19. Input: 1925 cm^3

    Output: 1425 cm^3

    $1925 \text{ cm}^3 - 1425 \text{ cm}^3 = 500 \text{ cm}^3$
20. yes; $31 \text{ hr} + 2 \text{ hr} + 3 \text{ hr} + 2 \text{ hr} + 3 \text{ hr} = 41 \text{ hr}$
21. $27,216$
22. $1,699,922$
23. $18,172,065$
24. $486,400$
25. $35,360,000$
26. $122,440,800$
27. 1809
28. $61,747$ r 1
29. 389
30. 434 r 24
31. 844 r 40
32. 1566 r 80
33. $31 \text{ mi/gal} \times 16 \text{ gal} = 496 \text{ mi}$
34. $65 \text{ L} \times 12 \text{ km/L} = 780 \text{ km}$
35. $1300 \text{ cm}^3 \div 4 = 325 \text{ cm}^3$
36. $1274 \text{ mi} \div 49 \text{ gal} = 26 \text{ mi/gal}$
37. $2340 \text{ km} \div 180 \text{ L} = 13 \text{ km/L}$
38. $\$13/4 \text{ ft} \times 20 \text{ ft} = \$65$
39. $\$516 \div 6 \text{ h} = \$86/\text{h}$
40. $\$596 \div 4 = \$149$
41. $125 \text{ mi/h} \times 4 \text{ h} = 500 \text{ mi}$
42. $500 \text{ ft/min} \times 15 \text{ min} = 7500 \text{ ft}$
43. $5 \times 18 \text{ ft} = 90 \text{ ft}$
    $42 \times 15 \text{ ft} = 630 \text{ ft}$
    $158 \times 12 \text{ ft} = 1896 \text{ ft}$
    $105 \times 10 \text{ ft} = 1050 \text{ ft}$
    $79 \times 8 \text{ ft} = 632 \text{ ft}$
    $87 \times 6 \text{ ft} = \underline{522 \text{ ft}}$
    Total = 4820 ft
44. There are 112 boards in the order.
    $36 \times 12 \text{ ft} = 432 \text{ ft}$
    $28 \times 10 \text{ ft} = 280 \text{ ft}$
    $36 \times 8 \text{ ft} = 288 \text{ ft}$
    $12 \times 16 \text{ ft} = \underline{192 \text{ ft}}$
    Total = 1192 ft
45. First draftperson:
    $8 \times 30 \times 80 = 19,200$ drawings
    Second draftperson:
    $8 \times 30 \times 120 = 28,800$ drawings
    Difference:
    $28,800 - 19,200 = 9600$ drawings
46. $5232 \text{ ft} \div 12 \text{ ft} = 436$

47. Horizontal position:

$$17 \text{ ft } 5 \text{ in.} = 17 \text{ ft} \times 12 \text{ in./ft} + 5 \text{ in.}$$
$$= 209 \text{ in.}$$
$$209 \text{ in.} - 75 \text{ in.} = 134 \text{ in.}$$
$$134 \text{ in.} \div 2 = 67 \text{ in. from either corner}$$

Center of window:

$$10 \text{ ft} = 10 \text{ ft} \times 12 \text{ in./ft} = 120 \text{ in.}$$
$$\frac{5}{8} \times 120 \text{ in.} = 75 \text{ in. above floor}$$

Bottom of window:

$$75 \text{ in.} - 54 \text{ in.}/2 = 75 \text{ in.} - 27 \text{ in.}$$
$$= 48 \text{ in. above floor}$$

48. $260 \text{ acres} \times 165 \text{ bu/acre} = 42{,}900 \text{ bu}$

49. $\dfrac{6864 \text{ bu}}{156 \text{ acre}} = 44 \text{ bu/acre}$

50. $\dfrac{12{,}000{,}000 \text{ bu}}{2035 \text{ bu/car}} = 5897 \text{ cars}$

51. a. $\dfrac{856 \text{ lb} + 754 \text{ lb} + 1044 \text{ lb} + 928 \text{ lb} + 888 \text{ lb} + 734 \text{ lb} + 953 \text{ lb} + 891 \text{ lb}}{8} = \dfrac{7048 \text{ lb}}{8 \text{ days}} = 881 \text{ lb/day}$

b. $\dfrac{4320 \text{ lb}}{36 \text{ days}} = 120 \text{ lb/day}; \quad \dfrac{120 \text{ lb/day}}{8 \text{ steers}} = 15 \text{ lb/day/steer}$

52. $\text{Number of bales} = 6 \times 110 \times 15 = 9900$

$$\text{Weight of bales} = \frac{9900 \times 80 \text{ lb}}{2000 \text{ lb/ton}} = 396 \text{ tons}$$

53. $\dfrac{92{,}480 \text{ lb}}{32 \text{ lb/bu}} = 2890 \text{ bu}$

$$\frac{2890 \text{ bu}}{34 \text{ acre}} = 85 \text{ lb/acre}$$

54. $15 \text{ tons} \times 2000 \text{ lb/ton} = 30{,}000 \text{ lb}$

$$\frac{30{,}000 \text{ lb}}{500 \text{ lb}} = 60 \text{ bales}$$

55. $\$175{,}000 - \$300 = \$172{,}000$

$$\frac{\$172{,}000}{10} = \$17{,}200$$

56. $\dfrac{400 \text{ gal}}{10 \text{ gal}} = 40$

$40 \times 2 \text{ lb} = 80 \text{ lb}$

57. $30 \text{ ft} \times 12 \text{ in./ft} = 360 \text{ in.}$

$360 \text{ in.} - 2 \times 5 \text{ in.} = 350 \text{ in.}$

$350 \text{ in.} \div 10 \text{ in.} = 35$

One additional daylily is required at the end of the planting so $35 + 1 = 36$ daylilies are needed in total.

58. $7 \times 75 \times 3 = 1575 \text{ lb}$

59. $I = \dfrac{E}{R} = \dfrac{220}{44} = 5 \text{ A}$

60. $I = \dfrac{E}{R} = \dfrac{48}{24} = 2 \text{ A}$

61. $E = IR = (2)(12) = 24 \text{ V}$

62. $E = IR = (2)(24) = 48 \text{ V}$

63. $220 \times 4 \text{ oz} = 880 \text{ oz}$

64. $3 \times 60 \text{ mg} = 180 \text{ g}$

$180 \text{ g} \div 30 \text{ g} = 6 \text{ tablets}$

65. $800 \text{ mg} \div 800 \text{ mg} = 4 \text{ tablets}$

66. $2 \times 5 \text{ g} = 10 \text{ g}$

67. $14 \text{ ft } 6 \text{ in.} - 4 \times (2 \text{ ft } 6 \text{ in.}) - 3 \times (1 \text{ ft})$

$= 14 \text{ ft } 6 \text{ in.} - 10 \text{ ft} - 3 \text{ ft}$

$= 1 \text{ ft } 6 \text{ in.}$

$(1 \text{ ft } 6 \text{ in.}) \div 2$

$= 18 \text{ in.} \div 2$

$= 9 \text{ in.}$

68. The outer dimension of the back wall is
$17 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} + 4 \text{ in.} = 208 \text{ in.}$ long and
$8 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} = 96 \text{ in.}$ high so there would be
$\frac{96 \text{ in.}}{8 \text{ in.}} = 12$ rows of $\frac{208 \text{ in.}}{16 \text{ in.}} = 13$ blocks, for a total of $2 \times 12 \times 13 = 312$ blocks for both walls. The outer dimensions of the side walls must fit inside the bricks of the back and front walls, so the side wall is
$12 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} + 8 \text{ in.} - 2 \times 4 \text{ in.} = 144 \text{ in.}$ long
and $8 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} = 96 \text{ in.}$ high so there would be $\frac{96 \text{ in.}}{8 \text{ in.}} = 12$ rows of $\frac{144 \text{ in.}}{16 \text{ in.}} = 9$ blocks, for a total of $2 \times 9 \times 12 = 216$ blocks for both walls. A total of $312 + 216 = 528$ blocks are needed.

69. $8 \text{ ft} - 3 \times (10 \text{ in.}) - 2 \times (1 \text{ ft } 2 \text{ in.})$
$= 96 \text{ in.} - 3 \times 10 \text{ in.} - 2 \times 14 \text{ in.}$
$= 96 \text{ in.} - 30 \text{ in.} - 28 \text{ in.}$
$= 38 \text{ in.}$
$38 \text{ in.} \div 2$
$= 19 \text{ in.}$

70. $2 \times 30 \text{ gal} = 60 \text{ gal}$
$60 \text{ gal} \div 5 \text{ gal/drum} = 12 \text{ drums}$
$\text{Order size} = 12 \text{ drums} - 8 \text{ drums}$
$= 4 \text{ drums}$

71. $2500 \div 1000 = 2.5$
$2.5 \times 8540 \text{ bd ft} = 213{,}500 \text{ bd ft}$

72. $2 \text{ lb} \times \frac{\$520}{2000 \text{ lb}} = \$0.52/\text{lb}$

73. $50 + 125 + 110 + 35 = 320$ seats

74. a. $125 \div 11 = 11$ r 4 so 12 beef loins are required.

b. Each beef loin has two end cuts, so $2 \times 12 = 24$ end cuts are available.

75. $2 \times 90 + 3 \times 4 + 2 \times 4 = 180 + 12 + 8 = 200$ items.

76. $\text{Number of tables} = 10 + 12$
$= 22$
$\text{Tables per server} = 22 \div 6$
$= 3 \text{ r } 4$
Servers needed = 4

77. a. $\$131 + \$152 + \$128 = \$411$

b. $\$411 \div 3 = \$137$

Section 1.2: Order of Operations

1. $8 - 3(4 - 2)$
$= 8 - 3(2)$
$= 8 - 6$
$= 2$

2. $(8 + 6)4 + 8$
$= (14)4 + 8$
$= 56 + 8$
$= 64$

3. $(8 + 6) - (7 - 3)$
$= 14 - 4$
$= 10$

4. $4 \times (2 \times 6) + (6 + 2) \div 4$
$= 4 \times 12 + 8 \div 4$
$= 48 + 2$
$= 50$

5. $2(9 + 5) - 6 \times (13 + 2) \div 9$
$= 2(14) - 6 \times 15 \div 9$
$= 28 - 90 \div 9$
$= 28 - 10$
$= 18$

6. $5(8 \times 9) + (13 + 7) \div 4$
$= 5(72) + 20 \div 4$
$= 5(72) + 20 \div 4$
$= 360 + 5$
$= 365$

7. $27+13\times(7-3)(12+6)\div 9$
$=27+13\times(4)(18)\div 9$
$=27+52(18)\div 9$
$=27+936\div 9$
$=27+104$
$=131$

8. $123-3(8+9)+17$
$=123-3(17)+17$
$=123-51+17$
$=89$

9. $16+4(7+8)-3$
$=16+4(15)-3$
$=16+60-3$
$=73$

10. $(18+17)(12+9)-(7\times 16)(4+2)$
$=(35)(21)-(112)(6)$
$=735-672$
$=63$

11. $9-2(17-15)+18$
$=9-2(2)+18$
$=9-4+18$
$=23$

12. $(9+7)5+13$
$=(16)5+13$
$=80+13$
$=93$

13. $(39-18)-(23-18)$
$=21-5$
$=16$

14. $5(3\times 7)+(8+4)\div 3$
$=5(21)+12\div 3$
$=105+4$
$=109$

15. $3(8+6)-7(13+3)\div 14$
$=3(14)-7(16)\div 14$
$=42-112\div 14$
$=42-8$
$=34$

16. $6(4\times 5)+(15+9)\div 6$
$=6(20)+24\div 6$
$=120+4$
$=124$

17. $42+12(9-3)(12+13)\div 30$
$=42+12(6)(25)\div 30$
$=42+72(25)\div 30$
$=42+1800\div 30$
$=42+60$
$=102$

18. $228-4\times(7+6)-8(6-2)$
$=228-4\times 13-8(4)$
$=228-52-32$
$=144$

19. $38+9\times(8+4)-3(5-2)$
$=38+9\times 12-3(3)$
$=38+108-9$
$=137$

20. $(19+8)(4+3)\div 21+(8\times 15)\div(4\times 3)$
$=(27)(7)\div 21+120\div 12$
$=189\div 21+10$
$=9+10$
$=19$

21. $27-2\times(18-9)-3+8(43-15)$
$=27-2\times 9-3+8(28)$
$=27-18-3+224$
$=230$

22. $6\times 8\div 2\times 8\div 12+6$
$=48\div 2\times 8\div 12+6$
$=24\times 8\div 12+6$
$=192\div 12+6$
$=16+6$
$=24$

23. $12\times 9\div 18\times 64\div 8+7$
$=108\div 18\times 64\div 8+7$
$=6\times 64\div 8+7$
$=384\div 8+7$
$=48+7$
$=55$

24. $18\div 6\times 24\div 4\div 6$
$=3\times 24\div 4\div 6$
$=72\div 4\div 6$
$=18\div 6$
$=3$

25. $7+6(3+2)-7-5(4+2)$
$=7+6(5)-7-5(6)$
$=7+30-7-30$
$=0$

26. $5+3(7\times 7)-6-2(4+7)$
$=5+3(49)-6-2(11)$
$=5+147-6-22$
$=124$

27. $3+17(2\times 2)-67$
$=3+17(4)-67$
$=3+68-67$
$=4$

28. $8-3(9-2)\div 21-7$
$=8-3(7)\div 21-7$
$=8-21\div 21-7$
$=8-1-7$
$=0$

29. $28-4(2\times 3)+4-(16\times 8)\div(4\times 4)$
$=28-4(6)+4-128\div 16$
$=28-24+4-8$
$=0$

30. $6+4(9+6)+8-2(7+3)-(3\times 12)\div 9$
$=6+4(15)+8-2(10)-36\div 9$
$=6+60+8-20-4$
$=50$

31. $24/(6-2)+4\times 3-15/3$
$=24/4+12-5$
$=6+12-5$
$=13$

32. $(36-6)/(5+10)+(16-1)/3$
$=30/15+15/3$
$=2+5$
$=7$

33. $3\times 15\div 9+(13-5)/2\times 4-2$
$=45\div 9+8/2\times 4-2$
$=5+4\times 4-2$
$=5+16-2$
19

34. $28/2\times 7-(6+10)/(6-2)$
$=14\times 7-16/4$
$=98-4$
$=94$

35. $10+4^2$
$=10+16$
$=26$

36. $4+2\cdot 3^2$
$=4+2\cdot 9$
$=4+18$
$=22$

37. $\dfrac{3\cdot 5+6\cdot 8}{53-2\cdot 5^2}$
$=\dfrac{15+48}{53-2\cdot 25}$
$=\dfrac{63}{53-50}$
$=\dfrac{63}{3}$
$=21$

38. $$\frac{3\cdot 4+2\cdot 3}{42-20\cdot 2\cdot 1}$$
$$=\frac{12+6}{42-40\cdot 1}$$
$$=\frac{18}{42-40}$$
$$=\frac{18}{2}$$
$$=9$$

39. $$\frac{20+(2\cdot 3)^2}{7\cdot 2^3}$$
$$=\frac{20+6^2}{7\cdot 8}$$
$$=\frac{20+36}{56}$$
$$=\frac{56}{56}$$
$$=1$$

40. $$\frac{(20-2\cdot 5)^2}{3^3-2}$$
$$=\frac{(20-10)^2}{27-2}$$
$$=\frac{(10)^2}{25}$$
$$=\frac{100}{25}$$
$$=4$$

41. $$6\left[3+2(2+5)\right]$$
$$=6\left[3+2(7)\right]$$
$$=6[3+14]$$
$$=6[17]$$
$$=102$$

42. $$5\left((4+6)+2(5-2)\right)$$
$$=5\left((4+6)+2(5-2)\right)$$
$$=5\left(10+2(3)\right)$$
$$=5(10+6)$$
$$=5(16)$$
$$=80$$

43. $$5\times 2+3\left[2(5-3)+4(4+2)-3\right]$$
$$=10+3\left[2(2)+4(6)-3\right]$$
$$=10+3[4+24-3]$$
$$=10+3[25]$$
$$=10+75$$
$$=85$$

44. $$3\left(10+2\left(1+3\left(2+6(4-2)\right)\right)\right)$$
$$=3\left(10+2\left(1+3\left(2+6(2)\right)\right)\right)$$
$$=3\left(10+2\left(1+3\left(2+12\right)\right)\right)$$
$$=3\left(10+2\left(1+3(14)\right)\right)$$
$$=3\left(10+2\left(1+42\right)\right)$$
$$=3\left(10+2(43)\right)$$
$$=3(10+86)$$
$$=3(96)$$
$$=288$$

Section 1.3: Area and Volume

1. $A = l \times w$
$A = 12 \text{ yd} \times 8 \text{ yd}$
$= 96 \text{ yd}^2$

2. $A = l \times w$
$A = 12 \text{ m} \times 8 \text{ m}$
$= 96 \text{ m}^2$

3. $A = l \times w$
$A = 4100 \text{ ft} \times 75 \text{ ft}$
$= 307{,}500 \text{ ft}^2$

4. $A = l \times w$
$A = 12 \text{ mi} \times 22 \text{ mi}$
$= 264 \text{ mi}^2$

5. $A = l \times w$
$A = 191 \text{ in.} \times 73 \text{ in.}$
$= 13,943 \text{ in}^2$

6. $27 \text{ in.} \times 15 \text{ in.} = 405 \text{ in}^2$
$15 \text{ in.} \times 18 \text{ in.} = 270 \text{ in}^2$
$27 \text{ in.} \times 18 \text{ in.} = 486 \text{ in}^2$
$27 \text{ in.} \times 18 \text{ in.} = 486 \text{ in}^2$
$15 \text{ in.} \times 18 \text{ in.} = \underline{270 \text{ in}^2}$
$\text{Total} = 1917 \text{ in}^2$

7. Area of outer rectangle: $9 \text{ cm} \times 12 \text{ cm} = 108 \text{ cm}^2$
Area of inner rectangle: $6 \text{ cm} \times 4 \text{ cm} = \underline{24 \text{ cm}^2}$
Total area: $= 84 \text{ cm}^2$

8. Area of outer rectangle: $8 \text{ in.} \times 8 \text{ in.} = 64 \text{ in}^2$
Area of inner rectangle: $5 \text{ in.} \times 5 \text{ in.} = \underline{25 \text{ in}^2}$
Total area: $= 39 \text{ in}^2$

9. Area of left rectangle: $8 \text{ in.} \times 3 \text{ in.} = 24 \text{ in}^2$
Area of middle rectangle: $2 \text{ in.} \times 6 \text{ in.} = 12 \text{ in}^2$
Area of right rectangle: $3 \text{ in.} \times 4 \text{ in.} = \underline{12 \text{ in}^2}$
Total area: $= 48 \text{ in}^2$

10. Area of upper rectangle: $2 \text{ in.} \times 6 \text{ in.} = 12 \text{ in}^2$
Area of middle rectangle: $6 \text{ in.} \times 2 \text{ in.} = 12 \text{ in}^2$
Area of lower rectangle: $2 \text{ in.} \times 6 \text{ in.} = \underline{12 \text{ in}^2}$
Total area: $= 36 \text{ in}^2$

11. Area of upper rectangle: $3 \text{ in.} \times 6 \text{ in.} = 24 \text{ in}^2$
Area of lower rectangle: $7 \text{ in.} \times 4 \text{ in.} = \underline{28 \text{ in}^2}$
Total area: $= 52 \text{ in}^2$

12. Area of outer rectangle: $30 \text{ cm} \times 30 \text{ cm} = 900 \text{ cm}^2$
Area of squares: $4 \times 5 \text{ cm} \times 5 \text{ cm} = \underline{800 \text{ cm}^2}$
Total area: $= 800 \text{ cm}^2$

13. $\dfrac{48 \text{ in.} \times 36 \text{ in.}}{4 \text{ in.} \times 4 \text{ in.}} = \dfrac{1728 \text{ in}^2}{16 \text{ in}^2} = 108$ tiles are needed.

14. You must arrange the tiles so the 2 ft edges are along the 26 ft side, so there will be $\dfrac{26 \text{ ft}}{2 \text{ ft}} = 13$ tiles in that direction. There will be $\dfrac{24 \text{ ft}}{4 \text{ ft}} = 6$ tiles along the other edge of the ceiling, so there will be a total of $13 \times 6 = 78$ tiles.

15. Area of ceiling: $12 \text{ ft} \times 16 \text{ ft} = 192 \text{ ft}^2$

Area of left/right walls: $2 \times 8 \text{ ft} \times 12 \text{ ft} = 192 \text{ ft}^2$

Area of front/back walls: $2 \times 8 \text{ ft} \times 16 \text{ ft} = \underline{256 \text{ ft}^2}$

Total area: $= 640 \text{ ft}^2$

Twenty rooms will be $20 \times 640 \text{ ft}^2 = 12{,}800 \text{ ft}^2$ so $12{,}800 \text{ ft}^2 \div 640 \text{ ft}^2 = 32$ gallons of paint will be needed.

16. Since the area of a sheet of drywall is $4 \text{ ft} \times 8 \text{ ft} = 32 \text{ ft}^2$ $12{,}800 \text{ ft}^2 \div 32 \text{ ft}^2 = 400$ pieces of drywall will be needed.

17. a. $A = l \times w$

$A = 24 \text{ ft} \times 45 \text{ ft}$

$= 1080 \text{ ft}^2$

$\text{Value} = 1080 \text{ ft}^2 \times \$110/\text{ft}^2$

$= \$118{,}800$

b. Area of upper rectangle: $24 \text{ ft} \times 85 \text{ ft} = 2040 \text{ ft}^2$

Area of lower rectangle: $19 \text{ ft} \times 16 \text{ ft} = \underline{304 \text{ ft}^2}$

Total area: $= 2344 \text{ ft}^2$

$\text{Value} = 2344 \text{ ft}^2 \times \$110/\text{ft}^2 = \$257{,}840$

18. Area of upper rectangle: $28 \text{ ft} \times 75 \text{ ft} = 2100 \text{ ft}^2$

Area of lower left rectangle: $16 \text{ ft} \times 26 \text{ ft} = 416 \text{ ft}^2$

Area of lower right rectangle: $12 \text{ ft} \times 24 \text{ ft} = \underline{288 \text{ ft}^2}$

Total area: $= 2804 \text{ ft}^2$

$\text{Value} = 2804 \text{ ft}^2 \times \$90/\text{ft}^2 = \$252{,}360$

19. $V = l \times w \times h$

$V = 3 \text{ m} \times 4 \text{ m} \times 8 \text{ m}$

$= 96 \text{ m}^3$

20. $V = l \times w \times h$

$V = 10 \text{ ft} \times 20 \text{ ft} \times 8 \text{ ft}$

$= 1600 \text{ ft}^3$

21. Volume of upper box: $6 \text{ cm} \times 4 \text{ cm} \times 5 \text{ cm} = 120 \text{ cm}^3$

Volume of lower box: $6 \text{ cm} \times 20 \text{ cm} \times 5 \text{ cm} = \underline{600 \text{ cm}^3}$

Total Volume: $= 720 \text{ cm}^3$

22. Volume of left box: $3 \text{ cm} \times 3 \text{ cm} \times 18 \text{ cm} = 162 \text{ cm}^3$

Volume of right box: $6 \text{ cm} \times 15 \text{ cm} \times 3 \text{ cm} = \underline{270 \text{ cm}^3}$

Total Volume: $= 432 \text{ cm}^3$

23. Volume of left box: $5 \text{ in.} \times 6 \text{ in.} \times 40 \text{ in.} = 1200 \text{ in}^3$

Volume of middle box: $25 \text{ in.} \times 6 \text{ in.} \times 10 \text{ in.} = 1500 \text{ in}^3$

Volume of right box: $5 \text{ in.} \times 6 \text{ in.} \times 40 \text{ in.} = \underline{1200 \text{ in}^3}$

Total Volume: $= 3900 \text{ in}^3$

24. Volume of left box: $8 \text{ ft} \times 8 \text{ ft} \times 20 \text{ ft} = 1280 \text{ ft}^3$
Volume of middle box: $32 \text{ ft} \times 8 \text{ ft} \times 8 \text{ ft} = 2048 \text{ ft}^3$
Volume of right box: $8 \text{ ft} \times 20 \text{ ft} \times 15 \text{ ft} = 2400 \text{ ft}^3$
Total Volume: $= 5728 \text{ ft}^3$

25. $V = l \times w \times h$
$V = 10 \text{ cm} \times 12 \text{ cm} \times 5 \text{ cm}$
$= 600 \text{ cm}^3$

26. $V = l \times w \times h$
$V = 20 \text{ ft} \times 10 \text{ ft} \times 8 \text{ ft}$
$= 1600 \text{ ft}^3$

27. $V = l \times w \times h$
$V = 8 \text{ in.} \times 20 \text{ in.} \times 72 \text{ in.}$
$= 11,520 \text{ in}^3$

28. $V = l \times w \times h$
$V = 16 \text{ in.} \times 20 \text{ in.} \times 1 \text{ in.}$
$= 320 \text{ in}^3$

29. $V = l \times w \times h$
$V = 3 \text{ ft} \times 5 \text{ ft} \times 2 \text{ ft}$
$= 30 \text{ ft}^3$

30. $V = l \times w \times h$
$V = 14 \text{ in.} \times 16 \text{ in.} \times 4 \text{ in.}$
$= 896 \text{ in}^3$

31. $V = l \times w \times h$
$V = 15 \text{ ft} \times 12 \text{ ft} \times 2 \text{ ft}$
$= 360 \text{ ft}^3$

So, the cement will weigh
$360 \text{ ft}^3 \times 193 \text{ lb/ft}^3 = 69,480 \text{ lb.}$

32. $V = l \times w \times h$
$V = 5 \text{ ft} \times 6 \text{ ft} \times 5 \text{ ft}$
$= 150 \text{ ft}^3$

So, the coal will weigh
$150 \text{ ft}^3 \times 40 \text{ lb/ft}^3 = 6000 \text{ lb}$ which is
$6000 \text{ lb} \div 2000 \text{ lb} = 3 \text{ tons.}$

33. $V = l \times w \times h$
$V = 8 \text{ ft} \times 5 \text{ ft} \times 6 \text{ ft}$
$= 240 \text{ ft}^3$

So, the water will weigh
$240 \text{ ft}^3 \times 62 \text{ lb/ft}^3 = 14,880 \text{ lb.}$

34. $V = l \times w \times h$
$V = 9 \text{ ft} \times 6 \text{ ft} \times 4 \text{ ft}$
$= 216 \text{ ft}^3$

So, the gasoline will weigh
$216 \text{ ft}^3 \times 42 \text{ lb/ft}^3 = 9072 \text{ lb.}$

35. $V = l \times w \times h$
$V = 100 \text{ ft} \times 50 \text{ ft} \times 10 \text{ ft}$
$= 50,000 \text{ ft}^3$

So, the cost of heating the space will be
$50,000 \text{ ft}^3 \div 1000 \text{ ft}^3 \times \$55 = \$2750.$

36. The remaining area is
$113 \text{ ft} \times 90 \text{ ft} = 10170 \text{ ft}^2$ so there could be
$10170 \text{ ft}^2 \div 4000 \text{ ft}^2 = 2 \text{ r } 2170$ or 2 stores.

37. a. The height of the cardboard sheet would be $16 \text{ in.} + 9 \text{ in.} = 25 \text{ in.}$ and the width would be $4 \times 9 \text{ in.} + 1 \text{ in.} = 37 \text{ in.}$

b. The area of the cardboard sheet would be $25 \text{ in.} \times 37 \text{ in.} = 925 \text{ in}^2.$

c. The total area of cardboard removed would be $1 \text{ in.} \times 9 \text{ in.} = 9 \text{ in}^2.$

38. The volume of the box is
$16 \text{ in.} \times 9 \text{ in.} \times 9 \text{ in.} = 1296 \text{ in}^3$ so
$1296 \text{ in}^3 - 450 \text{ in}^3 = 846 \text{ in}^3$ of peanuts are required.

39. $V = l \times w \times h$
$V = 4 \text{ ft} \times 4 \text{ ft} \times 8 \text{ ft}$
$= 128 \text{ ft}^3$

40. $A = l \times w$
$A = 125 \text{ ft} \times 24 \text{ ft}$
$= 3000 \text{ ft}^2$

$V = l \times w \times h$
$V = 125 \text{ ft} \times 24 \text{ ft} \times 12 \text{ ft}$
$= 36,000 \text{ ft}^3$

41. $8 \text{ ft} \times 12 \text{ in./ft} = 96 \text{ in.}$
$24 \text{ ft} \times 12 \text{ in./ft} = 288 \text{ in.}$
$V = l \times w \times h$
$= 96 \text{ in.} \times 288 \text{ in.} \times 3 \text{ in.}$
$= 82,944 \text{ in}^3$

$1 \text{ ft}^3 = 1728 \text{ in}^3$, so $\frac{82,944 \text{ in}^3}{1728 \text{ in}^3} = 48 \text{ ft}^3$ of mulch are needed.

42. $4 \text{ ft} \times 12 \text{ in./ft} = 48 \text{ in.}$
$8 \text{ ft} \times 12 \text{ in./ft} = 96 \text{ in.}$
$48 \text{ in.} \times 96 \text{ in.} = 4608 \text{ in}^2$
$4 \text{ in.} \times 4 \text{ in.} = 16 \text{ in}^2$
$\frac{4608 \text{ in}^2}{16 \text{ in}^2} = 288$ containers

Section 1.4: Formulas

1. $W = fd$
$W = (30)(20)$
$= 600$

2. $W = fd$
$W = (17)(9)$
$= 153$

3. $W = fd$
$W = (1125)(10)$
$= 11,250$

4. $W = fd$
$W = (203)(27)$
$= 5481$

5. $W = fd$
$W = (176)(326)$
$= 57,376$

6. $W = fd$
$W = (2400)(120)$
$= 288,000$

7. $f = ma$
$f = (1600)(24)$
$= 38,400$

8. $P = \frac{V^2}{R}$
$P = \frac{(120)^2}{24}$
$= \frac{14,400}{24}$
$= 600$

9. $I = \frac{E}{R}$
$I = \frac{120}{15}$
$= 8$

10. $d = vt$
$d = (372)(18)$
$= 6696$

11. $P = IE$
$P = (29)(173)$
$= 5017$

12. $W = IEt$
$W = (11)(95)(46)$
$= 48,070$

13. $A = \frac{1}{2}bh$

$A = \frac{1}{2}(10 \text{ in.})(8 \text{ in.})$

$= 40 \text{ in}^2$

14. $A = \frac{1}{2}bh$

$A = \frac{1}{2}(36 \text{ cm})(20 \text{ cm})$

$= 360 \text{ cm}^2$

15. $A = \frac{1}{2}bh$

$A = \frac{1}{2}(54 \text{ ft})(30 \text{ ft})$

$= 810 \text{ ft}^2$

16. $A = \frac{1}{2}bh$

$A = \frac{1}{2}(188 \text{ m})(220 \text{ m})$

$= 20,680 \text{ m}^2$

17. $A = lw$

$A = (8 \text{ m})(7 \text{ m})$

$= 56 \text{ m}^2$

18. $A = lw$

$A = (24 \text{ in.})(15 \text{ in.})$

$= 360 \text{ in}^2$

19. $A = lw$

$A = (36 \text{ ft})(18 \text{ ft})$

$= 648 \text{ ft}^2$

20. $A = lw$

$A = (250 \text{ cm})(120 \text{ cm})$

$= 30,000 \text{ cm}^2$

25. $V = lwh$

$V = (25 \text{ cm})(15 \text{ cm})(12 \text{ cm})$

$= 4500 \text{ cm}^3$

26. $V = lwh$

$V = (48 \text{ in.})(24 \text{ in.})(96 \text{ in.})$

$= 110,592 \text{ in}^3$

21. $A = \left(\frac{a+b}{2}\right)h$

$A = \left(\frac{7 \text{ ft} + 9 \text{ ft}}{2}\right)(4 \text{ ft})$

$= \left(\frac{16 \text{ ft}}{2}\right)(4 \text{ ft})$

$= (8 \text{ ft})(4 \text{ ft})$

$= 32 \text{ ft}^2$

22. $A = \left(\frac{a+b}{2}\right)h$

$A = \left(\frac{30 \text{ in.} + 50 \text{ in.}}{2}\right)(24 \text{ in.})$

$= \left(\frac{80 \text{ in.}}{2}\right)(24 \text{ in.})$

$= (40 \text{ in.})(24 \text{ in.})$

$= 960 \text{ in}^2$

23. $A = \left(\frac{a+b}{2}\right)h$

$A = \left(\frac{96 \text{ cm} + 24 \text{ cm}}{2}\right)(30 \text{ cm})$

$= \left(\frac{120 \text{ cm}}{2}\right)(30 \text{ cm})$

$= (60 \text{ cm})(30 \text{ cm})$

$= 1800 \text{ cm}^2$

24. $A = \left(\frac{a+b}{2}\right)h$

$A = \left(\frac{450 \text{ m} + 750 \text{ m}}{2}\right)(250 \text{ m})$

$= \left(\frac{1200 \text{ m}}{2}\right)(250 \text{ m})$

$= (600 \text{ m})(250 \text{ m})$

$= 150,000 \text{ m}^2$

27. $v = v_0 + gt$

$v = 12 + (32)(5)$

$= 172$

28. $Q = CV$

$Q = (12)(2500)$

$= 30,000$

29. $I = \dfrac{E}{Z}$

$I = \dfrac{240}{15}$

$= 16$

30. $P = I^2 R$

$P = (4)^2 (2000)$

$= 32,000$

Section 1.5: Prime Factorization

1. a. $1+5=6$ is divisible by 3, so 15 is divisible by 3.

   b. 15 is not divisible by 4.

2. a. $2+8=10$ is not divisible by 3, so 28 is not divisible by 3.

   b. 28 is divisible by 4.

3. a. $9+6=15$ is divisible by 3, so 96 is divisible by 3.

   b. 96 is divisible by 4.

4. a. $1+7+2=10$ is not divisible by 3, so 172 is not divisible by 3.

   b. 172 is divisible by 4.

5. a. $7+8=15$ is divisible by 3, so 78 is divisible by 3.

   b. 78 is not divisible by 4.

6. a. $6+7+5=18$ is divisible by 3, so 675 is divisible by 3.

   b. 675 is not divisible by 4.

7. 53 is prime

8. $57 = 3 \cdot 19$ is not prime

9. $93 = 3 \cdot 31$ is not prime

10. $121 = 11 \cdot 11$ is not prime

11. $16 = 2 \cdot 2 \cdot 2 \cdot 2$ is not prime

12. $123 = 3 \cdot 41$ is not prime

13. $39 = 3 \cdot 13$ is not prime

14. $87 = 3 \cdot 29$ is not prime

15. 458 is even, so it is divisible by 2.

16. 12,746 is even, so it is divisible by 2.

17. 315,817 is odd, so it is not divisible by 2.

18. 877,778 is even, so it is divisible by 2.

19. 1367 is odd, so it is not divisible by 2.

20. 1205 is odd, so it is not divisible by 2.

21. $3+8+7=18$ is divisible by 3, so 387 is divisible by 3.

22. $1+2+5+4=12$ is divisible by 3, so 1254 is divisible by 3.

23. $4+5+3+1+2+8=23$ is not divisible by 3, so 453,128 is not divisible by 3.

24. $1+7+8+2+1+3=22$ is not divisible by 3, so 178,213 is not divisible by 3.

25. $2+1+8+7+4+5=27$ is divisible by 3, so 218,745 is divisible by 3.

26. $1+5+6+9+0=21$ is divisible by 3, so 15,690 is divisible by 3.

27. 70 ends in 0, so it is divisible by 5.

28. 145 ends in 5, so it is divisible by 5.

29. 366 does not end in 0 or 5, so it is not divisible by 5.

30. 56,665 ends in 5, so it is divisible by 5.

31. 63,227 does not end in 0 or 5, so it is not divisible by 5.

32. 14,601 does not end in 0 or 5, so it is not divisible by 5.

33. 56 is even, so it is divisible by 2.

34. $4+2=6$ is divisible by 3, so 42 is divisible by 3.

35. $2+1+8=11$ is not divisible by 3, so 218 is not divisible by 3.

36. 375 ends in 5, so it is divisible by 5.

37. 528 does not end in 0 or 5, so it is not divisible by 5.

38. $2+1+8+4=15$ is divisible by 3, so 2184 is divisible by 3.

39. $1+9+8=18$ is divisible by 3, so 198 is divisible by 3.

40. $2+2+3+6=13$ is not divisible by 3, so 2236 is not divisible by 3.
41. $1,820,670$ is even, so it is divisible by 2.
42. $2,817,638$ is even, so it is divisible by 2.
43. $7,215,720$ ends in 0, so it is divisible by 5.
44. $5+2+7+5+3+4+3=29$ is not divisible by 3, so $5,275,343$ is not divisible by 3.
45. $2\cdot2\cdot5$
46. $2\cdot3\cdot3$
47. $2\cdot3\cdot11$
48. $2\cdot3\cdot5$
49. $2\cdot2\cdot3\cdot3$
50. $5\cdot5$
51. $3\cdot3\cdot3$
52. 59 is prime
53. $51=3\cdot17$
54. $56=2\cdot2\cdot2\cdot7$
55. $42=2\cdot3\cdot7$
56. $63=3\cdot3\cdot7$
57. $120=2\cdot2\cdot2\cdot3\cdot5$
58. $72=2\cdot2\cdot2\cdot3\cdot3$
59. $171=3\cdot3\cdot19$
60. $360=2\cdot2\cdot2\cdot3\cdot3\cdot5$
61. $105=3\cdot5\cdot7$
62. $78=2\cdot3\cdot13$
63. $252=2\cdot2\cdot3\cdot3\cdot7$
64. $444=2\cdot2\cdot3\cdot37$

Unit 1A Review

1. 241
2. 1795
3. $2,711,279$
4. 620
5. $3\times12\text{ ft}=36\text{ ft}$
   $8\times8\text{ ft}=64\text{ ft}$
   $9\times10\text{ ft}=90\text{ ft}$
   $12\times6\text{ ft}=\underline{72\text{ ft}}$
   $\text{Total}=262\text{ ft}$
6. $14,244\text{ lb}\div56\text{ lb}=254\text{ bu}$
7. $6+2(5\times4-2)$
   $=6+2(20-2)$
   $=6+2(18)$
   $=6+23$
   $=42$
8. $3^2+12\div3-2\times3$
   $=9+4-6$
   $=7$
9. $12+2\left[3(8-2)-2(3+1)\right]$
   $=12+2\left[3(6)-2(4)\right]$
   $=12+2[18-8]$
   $=12+2[10]$
   $=12+20$
   $=32$
10. Area of left rectangle: $24\text{ in.}\times11\text{ in.}=264\text{ in}^2$
    Area of middle rectangle: $15\text{ in.}\times11\text{ in.}=165\text{ in}^2$
    Area of right rectangle: $10\text{ in.}\times7\text{ in.}=\underline{70\text{ in}^2}$
    Total area: $=499\text{ in}^2$
11. $V=lwh$
    $V=(15\text{ ft})(8\text{ ft})(6\text{ ft})$
    $=720\text{ ft}^3$
12. $d=vt$
    $d=(45)(4)$
    $=180$

13. $I = \dfrac{E}{R}$

$I = \dfrac{120}{12}$

$= 10$

14. $A = \dfrac{1}{2}bh$

$A = \dfrac{1}{2}(40)(15)$

$= 300$

15. $51 = 3 \cdot 17$ is not prime.

16. 47 is prime.

17. $1+9+5 = 15$ is divisible by 3, so 195 is not divisible by 3.

18. 821 does not end in 0 or 5, so it is not divisible by 5.

19. $40 = 2 \cdot 2 \cdot 2 \cdot 5$

20. $135 = 3 \cdot 3 \cdot 3 \cdot 5$

Section 1.6: Introduction to Fractions

1. $\dfrac{12}{28} = \dfrac{2 \cdot 2 \cdot 3}{2 \cdot 2 \cdot 7} = \dfrac{3}{7}$

2. $\dfrac{9}{12} = \dfrac{3 \cdot 3}{2 \cdot 2 \cdot 3} = \dfrac{3}{4}$

3. $\dfrac{36}{42} = \dfrac{2 \cdot 2 \cdot 3 \cdot 3}{2 \cdot 3 \cdot 7} = \dfrac{6}{7}$

4. $\dfrac{12}{18} = \dfrac{2 \cdot 2 \cdot 3}{2 \cdot 3 \cdot 3} = \dfrac{2}{3}$

5. $\dfrac{9}{48} = \dfrac{3 \cdot 3}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 3} = \dfrac{3}{16}$

6. $\dfrac{8}{10} = \dfrac{2 \cdot 2 \cdot 2}{2 \cdot 5} = \dfrac{4}{5}$

7. $\dfrac{13}{39} = \dfrac{13}{3 \cdot 13} = \dfrac{1}{3}$

8. $\dfrac{24}{36} = \dfrac{2 \cdot 2 \cdot 2 \cdot 3}{2 \cdot 2 \cdot 3 \cdot 3} = \dfrac{2}{3}$

9. $\dfrac{48}{60} = \dfrac{2 \cdot 2 \cdot 2 \cdot 2 \cdot 3}{2 \cdot 2 \cdot 3 \cdot 5} = \dfrac{4}{5}$

10. $\dfrac{72}{96} = \dfrac{2 \cdot 2 \cdot 2 \cdot 3 \cdot 3}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3} = \dfrac{3}{4}$

11. $\dfrac{9}{9} = 1$

12. $\dfrac{15}{1} = 15$

13. $\dfrac{0}{8} = 0$

14. $\dfrac{6}{6} = 1$

15. $\dfrac{9}{0}$ is undefined.

16. $\dfrac{6}{8} = \dfrac{2 \cdot 3}{2 \cdot 2 \cdot 2} = \dfrac{3}{4}$

17. $\dfrac{14}{16} = \dfrac{2 \cdot 7}{2 \cdot 2 \cdot 2 \cdot 2} = \dfrac{7}{8}$

18. $\dfrac{7}{28} = \dfrac{7}{2 \cdot 2 \cdot 7} = \dfrac{1}{4}$

19. $\dfrac{27}{36} = \dfrac{3 \cdot 3 \cdot 3}{2 \cdot 2 \cdot 3 \cdot 3} = \dfrac{3}{4}$

20. $\dfrac{15}{18} = \dfrac{3 \cdot 5}{2 \cdot 3 \cdot 3} = \dfrac{5}{6}$

21. $\dfrac{12}{16} = \dfrac{2 \cdot 2 \cdot 3}{2 \cdot 2 \cdot 2 \cdot 2} = \dfrac{3}{4}$

22. $\dfrac{9}{18} = \dfrac{3 \cdot 3}{2 \cdot 3 \cdot 3} = \dfrac{1}{2}$

23. $\dfrac{20}{25} = \dfrac{2 \cdot 2 \cdot 5}{5 \cdot 5} = \dfrac{4}{5}$

24. $\dfrac{12}{36} = \dfrac{2 \cdot 2 \cdot 3}{2 \cdot 2 \cdot 3 \cdot 3} = \dfrac{1}{3}$

25. $\dfrac{12}{40} = \dfrac{2 \cdot 2 \cdot 3}{2 \cdot 2 \cdot 2 \cdot 5} = \dfrac{3}{10}$

26. $\dfrac{54}{72} = \dfrac{2 \cdot 3 \cdot 3 \cdot 3}{2 \cdot 2 \cdot 2 \cdot 3 \cdot 3} = \dfrac{3}{4}$

27. $\dfrac{112}{128} = \dfrac{2 \cdot 2 \cdot 2 \cdot 2 \cdot 7}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2} = \dfrac{7}{8}$

28. $\dfrac{330}{360} = \dfrac{2 \cdot 3 \cdot 5 \cdot 11}{2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 5} = \dfrac{11}{12}$

29. $\frac{112}{144} = \frac{2\cdot 2\cdot 2\cdot 2\cdot 7}{2\cdot 2\cdot 2\cdot 2\cdot 3\cdot 3} = \frac{7}{9}$

30. $\frac{525}{1155} = \frac{3\cdot 5\cdot 5\cdot 7}{3\cdot 5\cdot 7\cdot 11} = \frac{5}{11}$

31. $\frac{78}{5} = 15 \text{ r } 3 = 15\frac{3}{5}$

32. $\frac{11}{4} = 2 \text{ r } 3 = 2\frac{3}{4}$

33. $\frac{28}{3} = 9 \text{ r } 1 = 9\frac{1}{3}$

34. $\frac{21}{3} = 7 \text{ r } 0 = 7$

35. $\frac{45}{36} = \frac{5}{4} = 1 \text{ r } 1 = 1\frac{1}{4}$

36. $\frac{67}{16} = 4 \text{ r } 3 = 4\frac{3}{16}$

37. $\frac{57}{6} = \frac{19}{2} = 9 \text{ r } 1 = 9\frac{1}{2}$

38. $\frac{84}{9} = \frac{28}{3} = 9 \text{ r } 1 = 9\frac{1}{3}$

39. $5\frac{15}{12} = 5\frac{5}{4} = 5 + \left(1\frac{1}{4}\right) = 6\frac{1}{4}$

40. $2\frac{70}{16} = 2\frac{35}{8} = 2 + \left(4\frac{3}{8}\right) = 6\frac{3}{8}$

41. $3\frac{5}{6} = \frac{(3\times 6)+5}{6} = \frac{23}{6}$

42. $6\frac{3}{4} = \frac{(6\times 4)+3}{4} = \frac{27}{4}$

43. $2\frac{1}{8} = \frac{(2\times 8)+1}{8} = \frac{17}{8}$

44. $5\frac{2}{3} = \frac{(5\times 3)+2}{3} = \frac{17}{3}$

45. $1\frac{7}{16} = \frac{(1\times 16)+7}{16} = \frac{23}{16}$

46. $4\frac{1}{2} = \frac{(4\times 2)+1}{2} = \frac{9}{2}$

47. $6\frac{7}{8} = \frac{(6\times 8)+7}{8} = \frac{55}{8}$

48. $8\frac{1}{5} = \frac{(8\times 5)+1}{5} = \frac{41}{5}$

49. $10\frac{3}{5} = \frac{(10\times 5)+3}{5} = \frac{53}{5}$

50. $12\frac{5}{6} = \frac{(12\times 6)+5}{6} = \frac{77}{6}$

51. $\frac{28}{6} = \frac{14}{3} = 4 \text{ r } 2 = 4\frac{2}{3}$ pies

52. a. $1\frac{1}{3} = \frac{(1\times 3)+1}{3} = \frac{4}{3}$ cups

b. $\frac{15}{4} = 3 \text{ r } 3 = 3\frac{3}{4}$ cups

c. $\frac{3}{2} = 1 \text{ r } 1 = 1\frac{1}{2}$ cups

Section 1.7: Addition and Subtraction of Fractions

1. 16
2. 105
3. 210
4. 315
5. 48
6. 70
7. $\frac{2}{3} + \frac{1}{6} = \frac{4}{6} + \frac{1}{6} = \frac{5}{6}$
8. $\frac{1}{2} + \frac{3}{8} = \frac{4}{8} + \frac{3}{8} = \frac{7}{8}$
9. $\frac{1}{16} + \frac{3}{32} = \frac{2}{32} + \frac{3}{32} = \frac{5}{32}$
10. $\frac{5}{6} + \frac{1}{18} = \frac{15}{18} + \frac{1}{18} = \frac{16}{18} = \frac{8}{9}$
11. $\frac{2}{7} + \frac{3}{28} = \frac{8}{28} + \frac{3}{28} = \frac{11}{28}$
12. $\frac{1}{9} + \frac{2}{45} = \frac{5}{45} + \frac{2}{45} = \frac{7}{45}$

13. $\frac{3}{8}+\frac{5}{64}=\frac{24}{64}+\frac{5}{64}=\frac{29}{64}$

14. $\frac{3}{10}+\frac{7}{100}=\frac{30}{100}+\frac{7}{100}=\frac{37}{100}$

15. $\frac{1}{5}+\frac{3}{20}=\frac{4}{20}+\frac{3}{20}=\frac{7}{20}$

16. $\frac{3}{4}+\frac{3}{16}=\frac{12}{16}+\frac{3}{16}=\frac{15}{16}$

17. $\frac{4}{5}+\frac{1}{2}=\frac{8}{10}+\frac{5}{10}=\frac{13}{10}=1\frac{3}{10}$

18. $\frac{2}{3}+\frac{4}{9}=\frac{6}{9}+\frac{4}{9}=\frac{10}{9}=1\frac{1}{9}$

19. $\frac{1}{3}+\frac{1}{6}+\frac{3}{16}+\frac{1}{12}=\frac{16}{48}+\frac{8}{48}+\frac{9}{48}+\frac{4}{48}=\frac{37}{48}$

20. $\frac{3}{16}+\frac{1}{8}+\frac{1}{3}+\frac{1}{4}=\frac{9}{48}+\frac{6}{48}+\frac{16}{48}+\frac{12}{48}=\frac{43}{48}$

21. $\frac{1}{20}+\frac{1}{30}+\frac{1}{40}=\frac{6}{120}+\frac{4}{120}+\frac{3}{120}=\frac{13}{120}$

22. $\frac{1}{14}+\frac{1}{15}+\frac{1}{6}=\frac{15}{210}+\frac{14}{210}+\frac{35}{210}$
$=\frac{64}{210}$
$=\frac{32}{105}$

23. $\frac{3}{10}+\frac{1}{14}+\frac{4}{15}=\frac{63}{210}+\frac{15}{210}+\frac{56}{210}$
$=\frac{134}{210}$
$=\frac{67}{105}$

24. $\frac{5}{36}+\frac{11}{72}+\frac{5}{6}=\frac{10}{72}+\frac{11}{72}+\frac{60}{72}=\frac{81}{72}=\frac{9}{8}=1\frac{1}{8}$

25. $\frac{7}{8}-\frac{3}{4}=\frac{7}{8}-\frac{6}{8}=\frac{1}{8}$

26. $\frac{9}{64}-\frac{2}{128}=\frac{18}{128}-\frac{2}{128}=\frac{16}{128}=\frac{1}{8}$

27. $\frac{4}{5}-\frac{3}{10}=\frac{8}{10}-\frac{3}{10}=\frac{5}{10}=\frac{1}{2}$

28. $\frac{7}{16}-\frac{1}{3}=\frac{21}{48}-\frac{16}{48}=\frac{5}{48}$

29. $\frac{9}{14}-\frac{3}{42}=\frac{27}{42}-\frac{3}{42}=\frac{24}{42}=\frac{4}{7}$

30. $\frac{8}{9}-\frac{5}{24}=\frac{64}{72}-\frac{15}{72}=\frac{49}{72}$

31. $\frac{9}{16}-\frac{13}{32}-\frac{1}{8}=\frac{18}{32}-\frac{13}{32}-\frac{4}{32}=\frac{1}{32}$

32. $\frac{7}{8}-\frac{2}{9}-\frac{1}{12}=\frac{63}{72}-\frac{16}{72}-\frac{6}{72}=\frac{41}{72}$

33. $2\frac{1}{2}=2\frac{2}{4}$
$4\frac{3}{4}=4\frac{3}{4}$
$6\frac{5}{4}=7\frac{1}{4}$

34. $3\frac{5}{8}=3\frac{5}{8}$
$5\frac{3}{4}=5\frac{6}{8}$
$8\frac{11}{8}=9\frac{3}{8}$

35. $3\ =2\frac{8}{8}$
$\frac{3}{8}=\frac{3}{8}$
$2\frac{5}{8}$

36. $8=7\frac{4}{4}$
$5\frac{3}{4}=5\frac{3}{4}$
$2\frac{1}{4}$

37. $8\frac{3}{16}=7\frac{19}{16}$
$3\frac{7}{16}=3\frac{7}{16}$
$4\frac{12}{16}=4\frac{3}{4}$

38. $5\frac{3}{8} = 5\frac{3}{8}$
$2\frac{3}{4} = 2\frac{6}{8}$
$7\frac{9}{8} = 8\frac{1}{8}$

39. $7\frac{3}{16} = 6\frac{19}{16}$
$4\frac{7}{8} = 4\frac{14}{16}$
$2\frac{5}{16}$

40. $8\frac{1}{4} = 7\frac{20}{16}$
$4\frac{7}{16} = 4\frac{7}{16}$
$3\frac{13}{16}$

41. $3\frac{4}{5} = 3\frac{36}{45}$
$9\frac{8}{9} = 9\frac{49}{45}$
$12\frac{86}{45} = 13\frac{41}{45}$

42. $4\frac{5}{12} = 4\frac{25}{60}$
$6\frac{17}{20} = 6\frac{51}{60}$
$10\frac{76}{60} = 10\frac{19}{15} = 11\frac{4}{15}$

43. $3\frac{9}{16} + 4\frac{7}{12} + 3\frac{1}{6}$
$= 3\frac{27}{48} + 4\frac{28}{48} + 3\frac{8}{48}$
$= 10\frac{63}{48} = 10\frac{21}{16} = 11\frac{5}{16}$

44. $5\frac{2}{5} + 3\frac{7}{10} + 4\frac{7}{15}$
$= 5\frac{12}{30} + 3\frac{21}{30} + 4\frac{14}{30}$
$= 12\frac{47}{30} = 13\frac{17}{30}$

45. $16\frac{5}{8} - 4\frac{7}{12} - 2\frac{1}{2}$
$= 16\frac{15}{24} - 4\frac{14}{24} - 2\frac{12}{24}$
$= 15\frac{39}{24} - 4\frac{14}{24} - 2\frac{12}{24}$
$= 9\frac{13}{24}$

46. $12\frac{9}{16} - 3\frac{1}{6} + 2\frac{1}{4}$
$= 12\frac{27}{48} - 3\frac{8}{48} + 2\frac{12}{48}$
$= 14\frac{39}{48} - 3\frac{8}{48}$
$= 11\frac{31}{48}$

47. $712\frac{3}{4}\text{ ft} + 563\text{ ft} + 961\frac{1}{2}\text{ ft}$
$= 712\frac{3}{4}\text{ ft} + 563\text{ ft} + 961\frac{2}{4}\text{ ft}$
$= 2236\frac{5}{4}\text{ ft} = 2237\frac{1}{4}\text{ ft}$

48. $3\frac{1}{4}\text{ ft} + 2\frac{3}{8}\text{ ft} + 3\frac{1}{8}\text{ ft} + 4\frac{3}{16}\text{ ft}$
$= 3\frac{4}{16}\text{ ft} + 2\frac{6}{16}\text{ ft} + 3\frac{2}{16}\text{ ft} + 4\frac{3}{16}\text{ ft}$
$= 12\frac{15}{16}\text{ ft}$

49. a. $2\frac{3}{8}\text{ ft} + 3\frac{7}{8}\text{ ft}$
$= 5\frac{10}{8}\text{ ft} = 6\frac{2}{8}\text{ ft} = 6\frac{1}{4}\text{ ft}$

b. $6\frac{1}{4}\text{ ft} - 4\frac{3}{4}\text{ ft}$
$= 5\frac{5}{4}\text{ ft} - 4\frac{3}{4}\text{ ft}$
$= 1\frac{2}{4}\text{ ft} = 1\frac{1}{2}\text{ ft}$

50. $\frac{1}{8}\text{ in.} - \frac{3}{32}\text{ in.} = \frac{4}{32}\text{ in.} - \frac{3}{32}\text{ in.}$
$= \frac{1}{32}\text{ in.}$

51. $13\frac{3}{4}\text{ gal}+11\frac{2}{5}\text{ gal}+10\frac{2}{5}\text{ gal}$

$=13\frac{15}{20}\text{ gal}+11\frac{8}{20}\text{ gal}+10\frac{8}{20}\text{ gal}$

$=34\frac{31}{20}\text{ gal}=35\frac{11}{20}\text{ gal}$

52. $50\text{ gal}-17\frac{1}{2}\text{ gal}-20\frac{3}{8}\text{ gal}$

$=50\text{ gal}-17\frac{4}{8}\text{ gal}-20\frac{3}{8}\text{ gal}$

$=50\text{ gal}-37\frac{7}{8}\text{ gal}$

$=49\frac{8}{8}\text{ gal}-37\frac{7}{8}\text{ gal}$

$=12\frac{1}{8}\text{ gal}$

53. $25\frac{1}{4}\text{ gal}-23\frac{3}{4}\text{ gal}$

$=24\frac{5}{4}\text{ gal}-23\frac{3}{4}\text{ gal}$

$=1\frac{2}{4}\text{ gal}=1\frac{1}{2}\text{ gal}$

54. $4\frac{1}{2}\text{ qt}+4\frac{1}{4}\text{ qt}+4\frac{3}{8}\text{ qt}$

$=4\frac{4}{8}\text{ qt}+4\frac{2}{8}\text{ qt}+4\frac{3}{8}\text{ qt}$

$=12\frac{9}{8}\text{ qt}=13\frac{1}{8}\text{ qt}$

55. $\frac{1}{3}\text{ h}+\frac{1}{4}\text{ h}+\frac{1}{4}\text{ h}$

$=\frac{4}{12}\text{ h}+\frac{3}{12}\text{ h}+\frac{3}{12}\text{ h}$

$=\frac{10}{12}\text{ h}=\frac{5}{6}\text{ h}$

60. a. $3\frac{9}{32}\text{ in.}-2\frac{5}{16}\text{ in.}$

$=3\frac{9}{32}\text{ in.}-2\frac{10}{32}\text{ in.}$

$=2\frac{41}{32}\text{ in.}-2\frac{10}{32}\text{ in.}$

$=\frac{31}{32}\text{ in.}$

56. $4\text{ ft}-3\frac{3}{4}\text{ ft}$

$=3\frac{4}{4}\text{ ft}-3\frac{3}{4}\text{ ft}=\frac{1}{4}\text{ ft}$

$4\text{ ft}-2\frac{1}{4}\text{ ft}$

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

$\frac{1}{4}\text{ ft}+1\frac{3}{4}\text{ ft}$

$=1\frac{4}{4}\text{ ft}=2\text{ ft}$

57. $\frac{1}{3}\text{ ton}+\frac{3}{4}\text{ ton}+\frac{9}{16}\text{ ton}$

$=\frac{16}{48}\text{ ton}+\frac{36}{48}\text{ ton}+\frac{27}{48}\text{ ton}$

$=\frac{79}{48}\text{ ton}=1\frac{31}{48}\text{ ton}$

58. $6\text{ lb}\times 16\text{ oz/lb}=96\text{ oz}$

$3\frac{1}{2}\text{ oz}+33\frac{1}{8}\text{ oz}+96\text{ oz}+10\frac{1}{3}\text{ oz}$

$=3\frac{12}{24}\text{ oz}+33\frac{3}{24}\text{ oz}+96\text{ oz}+10\frac{8}{24}\text{ oz}$

$=142\frac{23}{24}\text{ oz}$

59. $10\text{ in.}-\frac{3}{4}\text{ in.}-\frac{3}{4}\text{ in.}-\frac{1}{8}\text{ in.}-\frac{1}{8}\text{ in.}$

$=10\text{ in.}-\frac{6}{8}\text{ in.}-\frac{6}{8}\text{ in.}-\frac{1}{8}\text{ in.}-\frac{1}{8}\text{ in.}$

$=10\text{ in.}-\frac{14}{8}\text{ in.}$

$=9\frac{4}{4}\text{ in.}-1\frac{3}{4}\text{ in.}=8\frac{1}{4}\text{ in.}$

60. (continued)

b. $2\frac{5}{16}\text{ in.}+2\frac{1}{2}\text{ in.}+\frac{31}{32}\text{ in.}+2\frac{3}{8}\text{ in.}+3\frac{9}{32}\text{ in.}+2\frac{3}{8}\text{ in.}+2\frac{1}{2}\text{ in.}$

$=2\frac{10}{32}\text{ in.}+2\frac{16}{32}\text{ in.}+\frac{31}{32}\text{ in.}+2\frac{12}{32}\text{ in.}+3\frac{9}{32}\text{ in.}+2\frac{12}{32}\text{ in.}+2\frac{16}{32}\text{ in.}$

$=13\frac{106}{32}\text{ in.}=16\frac{10}{32}\text{ in.}=16\frac{5}{16}\text{ in.}$

61. a. $5\frac{9}{16}\text{ in.}-1\frac{1}{8}\text{ in.}-1\frac{1}{8}\text{ in.}$

$=5\frac{9}{16}\text{ in.}-1\frac{2}{16}\text{ in.}-1\frac{2}{16}\text{ in.}$

$=3\frac{5}{16}\text{ in.}$

b. $1\frac{1}{8}\text{ in.}+2\frac{5}{32}\text{ in.}+3\frac{5}{16}\text{ in.}+2\frac{5}{32}\text{ in.}+1\frac{1}{8}\text{ in.}+7\frac{11}{16}\text{ in.}+2\frac{1}{16}\text{ in.}+4\frac{3}{8}\text{ in.}+5\frac{1}{16}\text{ in.}$

$=1\frac{4}{32}\text{ in.}+2\frac{5}{32}\text{ in.}+3\frac{10}{32}\text{ in.}+2\frac{5}{32}\text{ in.}+1\frac{4}{32}\text{ in.}+7\frac{22}{32}\text{ in.}+2\frac{2}{32}\text{ in.}+4\frac{12}{32}\text{ in.}+5\frac{2}{32}\text{ in.}$

$=27\frac{66}{32}\text{ in.}=29\frac{2}{32}\text{ in.}=29\frac{1}{16}\text{ in.}$

62. a. $2\frac{1}{16}\text{ in.}+2\frac{17}{32}\text{ in.}$

$=2\frac{2}{32}\text{ in.}+2\frac{17}{32}\text{ in.}$

$=4\frac{19}{32}\text{ in.}$

b. $4\frac{19}{32}\text{ in.}+1\frac{1}{8}\text{ in.}+\frac{27}{32}\text{ in.}+2\frac{17}{32}\text{ in.}+2\text{ in.}+1\frac{29}{32}\text{ in.}+1\frac{9}{16}\text{ in.}$

$=4\frac{19}{32}\text{ in.}+1\frac{4}{32}\text{ in.}+\frac{27}{32}\text{ in.}+2\frac{17}{32}\text{ in.}+2\text{ in.}+1\frac{29}{32}\text{ in.}+1\frac{18}{32}\text{ in.}$

$=11\frac{114}{32}\text{ in.}=14\frac{18}{32}\text{ in.}=14\frac{9}{16}\text{ in.}$

63. a. $3\frac{1}{4}\text{ in.}-1\frac{3}{8}\text{ in.}-1\frac{5}{8}\text{ in.}$

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

$=3\frac{1}{4}\text{ in.}-3\text{ in.}=\frac{1}{4}\text{ in.}$

b. $3\frac{1}{4}\text{ in.}+\frac{15}{16}\text{ in.}+\frac{15}{16}\text{ in.}+1\frac{7}{8}\text{ in.}+1\frac{1}{4}\text{ in.}+\frac{13}{16}\text{ in.}+1\frac{3}{8}\text{ in.}+1\frac{7}{8}\text{ in.}$

$=3\frac{4}{16}\text{ in.}+\frac{15}{16}\text{ in.}+\frac{15}{16}\text{ in.}+1\frac{14}{16}\text{ in.}+1\frac{4}{16}\text{ in.}+\frac{13}{16}\text{ in.}+1\frac{6}{16}\text{ in.}+1\frac{14}{16}\text{ in.}$

$=7\frac{85}{16}\text{ in.}=12\frac{5}{16}\text{ in.}$

64. $59\frac{9}{32}\text{ in.}-19\frac{5}{8}\text{ in.}-17\frac{13}{16}\text{ in.}$

$=59\frac{9}{32}\text{ in.}-19\frac{20}{32}\text{ in.}-17\frac{26}{32}\text{ in.}$

$=59\frac{9}{32}\text{ in.}-36\frac{46}{32}\text{ in.}$

$=59\frac{9}{32}\text{ in.}-37\frac{14}{32}\text{ in.}$

$=58\frac{41}{32}\text{ in.}-37\frac{14}{32}\text{ in.}$

$=21\frac{27}{32}\text{ in.}$

65. $1\frac{3}{4}\text{ A}+1\frac{1}{2}\text{ A}$

$=1\frac{3}{4}\text{ A}+1\frac{2}{4}\text{ A}$

$=2\frac{5}{4}\text{ A}=3\frac{1}{4}\text{ A}$

66. $2\frac{1}{4}\text{ A}+\frac{1}{8}\text{ A}+\frac{1}{16}\text{ A}$

$=2\frac{4}{16}\text{ A}+\frac{2}{16}\text{ A}+\frac{1}{16}\text{ A}$

$=2\frac{7}{16}\text{ A}$

67. $\frac{1}{16}\text{ A}+\frac{1}{12}\text{ A}+1\frac{3}{4}\text{ A}$

$=\frac{3}{48}\text{ A}+\frac{4}{48}\text{ A}+1\frac{36}{48}\text{ A}$

$=1\frac{43}{48}\text{ A}$

68. $1\frac{1}{2}\text{ A}+\frac{3}{4}\text{ A}+\frac{3}{16}\text{ A}+\frac{7}{8}\text{ A}+2\frac{1}{2}\text{ A}$

$=1\frac{8}{16}\text{ A}+\frac{12}{16}\text{ A}+\frac{3}{16}\text{ A}+\frac{14}{16}\text{ A}+2\frac{8}{16}\text{ A}$

$=3\frac{45}{16}\text{ A}=5\frac{13}{16}\text{ A}$

69. $6\frac{3}{4}\text{ in.}+2\frac{7}{8}\text{ in.}$

$=6\frac{6}{8}\text{ in.}+2\frac{7}{8}\text{ in.}$

$=8\frac{13}{8}\text{ in.}=9\frac{5}{8}\text{ in.}$

70. $3\frac{3}{8}\text{ in.}+5\frac{5}{16}\text{ in.}+3\frac{3}{16}\text{ in.}$

$=3\frac{6}{16}\text{ in.}+5\frac{5}{16}\text{ in.}+3\frac{6}{16}\text{ in.}$

$=11\frac{17}{16}\text{ in.}=12\frac{1}{16}\text{ in.}$

71. a. $6\frac{7}{8}\text{ in.}+1\frac{3}{8}\text{ in.}+2\frac{1}{4}\text{ in.}$

$=6\frac{7}{8}\text{ in.}+1\frac{3}{8}\text{ in.}+2\frac{2}{8}\text{ in.}$

$=9\frac{12}{8}\text{ in.}=10\frac{4}{8}\text{ in.}=10\frac{1}{2}\text{ in.}$

b. $1\frac{5}{8}\text{ in.}-\frac{7}{16}\text{ in.}-\frac{7}{16}\text{ in.}$

$=1\frac{5}{8}\text{ in.}-\frac{14}{16}\text{ in.}$

$=1\frac{5}{8}\text{ in.}-\frac{7}{8}\text{ in.}$

$=\frac{13}{8}\text{ in.}-\frac{7}{8}\text{ in.}$

$=\frac{6}{8}\text{ in.}=\frac{3}{4}\text{ in.}$

72. $13\frac{13}{16}\text{ in.}-1\frac{3}{8}\text{ in.}-2\frac{5}{16}\text{ in.}-4\frac{3}{4}\text{ in.}-\frac{3}{16}\text{ in.}$

$=13\frac{13}{16}\text{ in.}-1\frac{6}{16}\text{ in.}-2\frac{5}{16}\text{ in.}-4\frac{12}{16}\text{ in.}-\frac{3}{16}\text{ in.}$

$=13\frac{13}{16}\text{ in.}-7\frac{26}{16}\text{ in.}$

$=13\frac{13}{16}\text{ in.}-8\frac{10}{16}\text{ in.}$

$=5\frac{3}{16}\text{ in.}$

73. a. $5\frac{1}{8}\text{ in.}+5\text{ in.}+7\frac{5}{8}\text{ in.}+4\frac{1}{16}\text{ in.}$

$=5\frac{2}{16}\text{ in.}+5\text{ in.}+7\frac{10}{16}\text{ in.}+4\frac{1}{16}\text{ in.}$

$=21\frac{13}{16}\text{ in.}$

73. (continued)

b. $7\frac{1}{4}\text{ in.}-3\frac{3}{16}\text{ in.}-3\frac{3}{16}\text{ in.}$

$=7\frac{1}{4}\text{ in.}-6\frac{6}{16}\text{ in.}$

$=7\frac{1}{4}\text{ in.}-6\frac{3}{8}\text{ in.}$

$=7\frac{2}{8}\text{ in.}-6\frac{3}{8}\text{ in.}$

$=6\frac{10}{8}\text{ in.}-6\frac{3}{8}\text{ in.}$

$=\frac{7}{8}\text{ in.}$

74. $7\frac{1}{8}\text{ in.}-\frac{7}{8}\text{ in.}-\frac{3}{16}\text{ in.}-\frac{7}{8}\text{ in.}-\frac{3}{16}\text{ in.}$

$=7\frac{1}{8}\text{ in.}-\frac{14}{16}\text{ in.}-\frac{3}{16}\text{ in.}-\frac{14}{16}\text{ in.}-\frac{3}{16}\text{ in.}$

$=7\frac{1}{8}\text{ in.}-\frac{34}{16}\text{ in.}$

$=7\frac{1}{8}\text{ in.}-\frac{17}{8}\text{ in.}$

$=7\frac{1}{8}\text{ in.}-2\frac{1}{8}\text{ in.}$

$=5\text{ in.}$

75. $16\text{ in.}-1\frac{5}{8}\text{ in.}=15\frac{8}{8}\text{ in.}-1\frac{5}{8}\text{ in.}$

$=14\frac{3}{8}\text{ in.}$

76. $\frac{3}{8}\text{ in.}-\frac{1}{16}\text{ in.}=\frac{6}{16}\text{ in.}-\frac{1}{16}\text{ in.}$

$=\frac{5}{16}\text{ in.}$

77. $\frac{7}{8}\text{ in.}-\frac{51}{64}\text{ in.}=\frac{56}{64}\text{ in.}-\frac{51}{64}\text{ in.}$

$=\frac{5}{64}\text{ in.}$

78. $\frac{5}{8}\text{ in.}-\frac{7}{16}\text{ in.}=\frac{10}{16}\text{ in.}-\frac{7}{16}\text{ in.}$

$=\frac{3}{16}\text{ in.}$

79. One cut:

$1\frac{7}{8}\text{ in.}-\frac{3}{32}\text{ in.}$

$=1\frac{28}{32}\text{ in.}-\frac{3}{32}\text{ in.}$

$=1\frac{25}{32}\text{ in.}$

Three cuts:

$1\frac{7}{8}\text{ in.}-\frac{3}{32}\text{ in.}-\frac{3}{32}\text{ in.}-\frac{3}{32}\text{ in.}$

$=1\frac{28}{32}\text{ in.}-\frac{3}{32}\text{ in.}-\frac{3}{32}\text{ in.}-\frac{3}{32}\text{ in.}$

$=1\frac{19}{32}\text{ in.}$

80. $65\frac{3}{4}\text{ ft}-5\frac{5}{12}\text{ ft}-43\frac{5}{6}\text{ ft}$

$=65\frac{9}{12}\text{ ft}-5\frac{5}{12}\text{ ft}-43\frac{10}{12}\text{ ft}$

$=64\frac{21}{12}\text{ ft}-5\frac{5}{12}\text{ ft}-43\frac{10}{12}\text{ ft}$

$=16\frac{6}{12}\text{ ft}=16\frac{1}{2}\text{ ft}$

81. Length:

$\frac{7}{32}\text{ in.}+3\frac{5}{16}\text{ in.}+\frac{7}{32}\text{ in.}+3\frac{5}{16}\text{ in.}+\frac{7}{32}\text{ in.}+3\frac{5}{16}\text{ in.}+\frac{7}{32}\text{ in.}$

$=\frac{7}{32}\text{ in.}+3\frac{10}{32}\text{ in.}+\frac{7}{32}\text{ in.}+3\frac{10}{32}\text{ in.}+\frac{7}{32}\text{ in.}+3\frac{10}{32}\text{ in.}+\frac{7}{32}\text{ in.}$

$=9\frac{58}{32}\text{ in.}=9\frac{29}{16}\text{ in.}=10\frac{13}{16}\text{ in.}$

Width:

$\frac{7}{32}\text{ in.}+3\frac{5}{16}\text{ in.}+\frac{7}{32}\text{ in.}=\frac{7}{32}\text{ in.}+3\frac{10}{32}\text{ in.}+\frac{7}{32}\text{ in.}=3\frac{24}{32}\text{ in.}=3\frac{3}{4}\text{ in.}$

82. $16 \text{ ft } 4\frac{1}{2} \text{ in.} - 1 \text{ ft } 2\frac{1}{4} \text{ in.} - 10\frac{3}{4} \text{ in.}$

$= 16 \text{ ft } 4\frac{1}{2} \text{ in.} - 1 \text{ ft } 2\frac{1}{4} \text{ in.} - 10\frac{3}{4} \text{ in.}$

$= 16 \text{ ft } 4\frac{1}{2} \text{ in.} - 1 \text{ ft } 2\frac{1}{4} \text{ in.} - 10\frac{3}{4} \text{ in.}$

$= 16 \text{ ft } 4\frac{1}{2} \text{ in.} - 1 \text{ ft } 12\frac{4}{4} \text{ in.}$

$= 15 \text{ ft } 16\frac{1}{2} \text{ in.} - 1 \text{ ft } 13 \text{ in.}$

$= 14 \text{ ft } 3\frac{1}{2} \text{ in.}$

83. $15\frac{3}{8} \text{ in.} + 7\frac{3}{4} \text{in.} + 11\frac{1}{2} \text{ in.} + 7\frac{7}{32} \text{ in.} + 10\frac{5}{16} \text{ in.}$

$= 15\frac{12}{32} \text{ in.} + 7\frac{24}{32} \text{in.} + 11\frac{16}{32} \text{ in.} + 7\frac{7}{32} \text{ in.} + 10\frac{10}{32} \text{ in.}$

$= 50\frac{69}{32} \text{ in.} = 52\frac{5}{32} \text{ in.}$

84. $\frac{15}{16} \text{ in.} + 3\frac{1}{4} \text{in.} + 2\frac{1}{16} \text{ in.} + 3\frac{3}{8} \text{ in.} + 1\frac{13}{16} \text{ in.} + 1\frac{1}{8} \text{ in.}$

$= \frac{15}{16} \text{ in.} + 3\frac{4}{16} \text{in.} + 2\frac{1}{16} \text{ in.} + 3\frac{6}{16} \text{ in.} + 1\frac{13}{16} \text{ in.} + 1\frac{2}{16} \text{ in.}$

$= 10\frac{41}{16} \text{ in.} = 12\frac{9}{16} \text{ in.}$

85. a. $1\frac{3}{32} \text{ in.} + 1\frac{10}{32} \text{in.} + 2\frac{12}{32} \text{ in.} + 1\frac{10}{32} \text{ in.} + 1\frac{3}{32} \text{ in.}$

$= 6\frac{38}{32} \text{ in.} = 7\frac{6}{32} \text{ in.} = 7\frac{3}{16} \text{ in.}$

b. $10\frac{1}{2} \text{ in.} - 6\frac{5}{8} \text{in.} - 2\frac{3}{16} \text{ in.}$

$= 10\frac{8}{16} \text{ in.} - 6\frac{10}{16} \text{in.} - 2\frac{3}{16} \text{ in.}$

$= 9\frac{24}{16} \text{ in.} - 6\frac{10}{16} \text{in.} - 2\frac{3}{16} \text{ in.}$

$= 1\frac{11}{16} \text{ in.}$

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

$= \frac{25}{12} = 1\frac{1}{12} \text{ cords}$

87. $1\frac{1}{2} \text{ acres} - \frac{1}{2} \text{ acre} - \frac{1}{6} \text{ acre} - \frac{1}{3} \text{ acre}$

$= \frac{3}{2} \text{ acres} - \frac{1}{2} \text{ acre} - \frac{1}{6} \text{ acre} - \frac{1}{3} \text{ acre}$

$= \frac{9}{6} \text{ acres} - \frac{3}{6} \text{ acre} - \frac{1}{6} \text{ acre} - \frac{2}{6} \text{ acre}$

$= \frac{3}{6} \text{ acre} = \frac{1}{2} \text{ acre}$

88. $1\frac{1}{2} \text{ mi} + 2\frac{3}{4} \text{ mi} + \frac{3}{4} \text{ mi} + \frac{1}{2} \text{ mi}$

$= 1\frac{2}{4} \text{ mi} + 2\frac{3}{4} \text{ mi} + \frac{3}{4} \text{ mi} + \frac{2}{4} \text{ mi}$

$= 3\frac{10}{4} \text{ mi} = 5\frac{2}{4} \text{ mi} = 5\frac{1}{2} \text{ mi}$

89. $\frac{3}{4}+\frac{1}{2}=\frac{3}{4}+\frac{4}{4}$
$=\frac{7}{4}=1\frac{3}{4}$ sticks

90. $15\frac{3}{8}-12\frac{1}{2}=15\frac{3}{8}-12\frac{4}{8}$
$=14\frac{11}{8}-12\frac{4}{8}$
$=2\frac{7}{8}$ pies

91. $3\frac{3}{8}-2\frac{1}{4}=3\frac{3}{8}-2\frac{2}{8}$
$=1\frac{1}{8}$ cups

92. $5\frac{1}{2}-1\frac{1}{2}-2\frac{3}{4}=5\frac{2}{4}-1\frac{2}{4}-2\frac{3}{4}$
$=4\frac{6}{4}-1\frac{2}{4}-2\frac{3}{4}$
$=1\frac{1}{4}$ heads

93. $1\frac{1}{2}+3-1\frac{3}{4}-2\frac{1}{2}-\frac{1}{8}=1\frac{4}{8}+3-1\frac{6}{8}-2\frac{4}{8}-\frac{1}{8}$
$=\frac{12}{8}+3-1\frac{6}{8}-2\frac{4}{8}-\frac{1}{8}$
$=\frac{1}{8}$ bag

94. $\frac{3}{8}+2-\frac{5}{16}=\frac{6}{16}+\frac{32}{16}-\frac{5}{16}=\frac{33}{16}=2\frac{1}{16}$ cases

Section 1.8: Multiplication and Division of Fractions

1. 12
2. 4
3. 9
4. $3\frac{1}{2}\times\frac{2}{5}=\frac{7}{2}\times\frac{2}{5}$
$=\frac{7}{5}=1\frac{2}{5}$
5. $1\frac{3}{4}\times\frac{5}{16}=\frac{7}{4}\times\frac{5}{16}$
$=\frac{35}{64}$
6. $\frac{1}{27}$
7. $\frac{2}{3}$
8. $\frac{15}{32}$
9. 10
10. $\frac{9}{16}\times\frac{2}{3}\times1\frac{6}{15}$
$=\frac{9}{16}\times\frac{2}{3}\times\frac{21}{15}$
$=\frac{9}{16}\times\frac{2}{3}\times\frac{7}{5}$
$=\frac{21}{40}$
11. $\frac{1}{8}$
12. $\frac{1}{20}$
13. $2\frac{1}{3}\times\frac{5}{8}\times\frac{6}{7}$
$=\frac{7}{3}\times\frac{5}{8}\times\frac{6}{7}$
$=\frac{5}{4}=1\frac{1}{4}$
14. $\frac{1}{63}$
15. $\frac{6}{11}\times\frac{26}{35}\times1\frac{9}{13}\times\frac{7}{12}$
$=\frac{6}{11}\times\frac{26}{35}\times\frac{22}{13}\times\frac{7}{12}$
$=\frac{2}{5}$
16. $\frac{3}{8}\div\frac{1}{4}=\frac{3}{8}\times\frac{4}{1}$
$=\frac{3}{2}=1\frac{1}{2}$
17. $\frac{3}{5}\div\frac{10}{12}=\frac{3}{5}\times\frac{12}{10}$
$=\frac{18}{25}$

18. $\frac{10}{12} \div \frac{3}{5} = \frac{10}{12} \times \frac{5}{3}$
$= \frac{25}{18} = 1\frac{7}{18}$

19. $4\frac{1}{2} \div \frac{1}{4} = \frac{9}{2} \div \frac{1}{4}$
$= \frac{9}{2} \times \frac{4}{1}$
$= 18$

20. $18\frac{2}{3} \div 6 = \frac{56}{3} \div 6$
$= \frac{56}{3} \times \frac{1}{6}$
$= \frac{28}{9} = 3\frac{1}{9}$

21. $15 \div \frac{3}{8}$
$= 15 \times \frac{8}{3}$
$= 40$

22. $\frac{77}{6} \div 6 = \frac{77}{6} \times \frac{1}{6}$
$= \frac{77}{36} = 2\frac{5}{36}$

23. $\frac{7}{11} \div \frac{3}{5} = \frac{7}{11} \times \frac{5}{3}$
$= \frac{35}{33} = 1\frac{2}{33}$

24. $7 \div 3\frac{1}{8} = 7 \div \frac{25}{8}$
$= 7 \times \frac{8}{25}$
$= \frac{56}{25} = 2\frac{6}{25}$

25. $\frac{2}{5} \times 3\frac{2}{3} \div \frac{3}{4} = \frac{2}{5} \times \frac{11}{3} \times \frac{4}{3}$
$= \frac{88}{45} = 1\frac{43}{45}$

26. $\frac{7}{8} \times \frac{1}{2} \div \frac{2}{7} = \frac{7}{8} \times \frac{1}{2} \times \frac{7}{2}$
$= \frac{49}{32} = 1\frac{17}{32}$

27. $\frac{16}{5} \times \frac{3}{2} \times \frac{10}{4} \div 5\frac{1}{3}$
$= \frac{16}{5} \times \frac{3}{2} \times \frac{10}{4} \div \frac{16}{3}$
$= \frac{16}{5} \times \frac{3}{2} \times \frac{10}{4} \times \frac{3}{16}$
$= \frac{9}{4} = 2\frac{1}{4}$

28. $6 \times 6 \times \frac{21}{7} \div 48$
$= 6 \times 6 \times \frac{21}{7} \times \frac{1}{48}$
$= \frac{9}{4} = 2\frac{1}{4}$

29. $\frac{7}{9} \times \frac{3}{8} \div \frac{28}{81}$
$= \frac{7}{9} \times \frac{3}{8} \times \frac{81}{28}$
$= \frac{27}{32}$

30. $2\frac{1}{3} \times \frac{5}{8} \div \frac{10}{4}$
$= \frac{7}{3} \times \frac{5}{8} \times \frac{4}{10}$
$= \frac{7}{12}$

31. $\frac{2}{7} \times \frac{5}{9} \times \frac{3}{10} \div 6$
$= \frac{2}{7} \times \frac{5}{9} \times \frac{3}{10} \times \frac{1}{6}$
$= \frac{1}{126}$

32. $\frac{9}{4} \times \frac{9}{4} \times \frac{21}{7} \div 81$
$= \frac{9}{4} \times \frac{9}{4} \times \frac{21}{7} \times \frac{1}{81}$
$= \frac{3}{16}$

33. $\frac{7}{16} \div \frac{3}{8} \times \frac{1}{2}$
$= \frac{7}{16} \times \frac{8}{3} \times \frac{1}{2}$
$= \frac{7}{12}$

34. $\frac{5}{8} \div \frac{25}{64} \times \frac{5}{6}$
$= \frac{5}{8} \times \frac{64}{25} \times \frac{5}{6}$
$= \frac{4}{3} = 1\frac{1}{3}$

35. $\frac{3}{4} \times 42 \text{ gal} = \frac{126}{4} \text{ gal} = \frac{63}{2} \text{ gal} = 31\frac{1}{2} \text{ gal}$

36. a. $A = l \times w$
$A = 6\frac{1}{3} \text{ ft} \times 3\frac{3}{4} \text{ ft}$
$= \frac{19}{3} \text{ ft} \times \frac{15}{4} \text{ ft}$
$= \frac{95}{4} \text{ ft}^2 = 23\frac{3}{4} \text{ ft}^2$

b. $P = 2l + 2w$
$P = 2 \times \left(6\frac{1}{3} \text{ ft}\right) + 2 \times \left(3\frac{3}{4} \text{ ft}\right)$
$= 2 \times \frac{19}{3} \text{ ft} + 2 \times \frac{15}{4} \text{ ft}$
$= \frac{38}{3} \text{ ft} + \frac{15}{2} \text{ ft}$
$= \frac{76}{6} \text{ ft} + \frac{45}{6} \text{ ft}$
$= \frac{121}{6} \text{ ft} = 20\frac{1}{6} \text{ ft}$

37. $7 \times 6\frac{1}{2} \text{ in.} = 7 \times \frac{13}{2} \text{ in.} = \frac{91}{2} \text{ in.} = 45\frac{1}{2} \text{ in.}$

39. $\frac{684\frac{1}{4} \text{ mi}}{5\frac{2}{3} \text{ h}} = \frac{\frac{2737}{4} \text{ mi}}{\frac{17}{3} \text{ h}} = \frac{2737}{4} \times \frac{3}{17} \text{ mi/h}$
$= \frac{483}{4} \text{ mi/h} = 120\frac{3}{4} \text{ mi/h}$

42. $\frac{17 \text{ ft}}{4\frac{1}{2} \text{ ft}} = \frac{17 \text{ ft}}{\frac{9}{2} \text{ ft}} = 17 \times \frac{2}{9} = \frac{34}{9} = 3\frac{7}{9}$ lengths

$17 \text{ ft} - 3 \times 4\frac{1}{2} \text{ ft} = 17 \text{ ft} - 3 \times \frac{9}{2} \text{ ft}$
$= \frac{34}{2} \text{ ft} - \frac{27}{2} \text{ ft} = \frac{7}{2} \text{ ft} = 3\frac{1}{2} \text{ ft}$

There will be three $4\frac{1}{2}$ ft pieces and one $4\frac{1}{2}$ ft piece.

38. Length of one cut:
$1\frac{3}{4} \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} + \frac{1}{16} \text{ in.}$
$= \frac{7}{4} \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} + \frac{1}{16} \text{ in.}$
$= 21\frac{1}{16} \text{ in.} = \frac{337}{16} \text{ in.}$

Length of pipe:
$6\frac{3}{4} \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}}$
$= \frac{27}{4} \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}}$
$= 81 \text{ in.}$

Number of pieces:
$\frac{81 \text{ in.}}{\frac{337}{16} \text{ in.}} = \frac{81}{1} \times \frac{16}{337}$
$= \frac{1296}{337} = 3\frac{285}{337}$
$= 3 \text{ pieces}$

Remaining length:
$81 \text{ in.} - 3 \times \frac{337}{16} \text{ in.} = \frac{1296}{16} \text{ in.} - \frac{1011}{16} \text{ in.}$
$= \frac{285}{16} \text{ in.} = 17\frac{13}{16} \text{ in.}$
$= 12 \text{ in.} + 5\frac{13}{16} \text{ in.}$
$= 1 \text{ ft } 5\frac{13}{16} \text{ in.}$

40. $5 \times 3\frac{1}{4} \text{ h} = 5 \times \frac{13}{4} \text{ h} = \frac{65}{4} \text{ h} = 16\frac{1}{4} \text{ h}$

41. $9 \times 3\frac{2}{3} \text{ ft} = 9 \times \frac{11}{3} \text{ ft} = 33 \text{ ft}$

43. $$\text{board feet} = \frac{\text{number of boards} \times \text{thickness (in in.)} \times \text{width (in in.)} \times \text{length (in ft)}}{12}$$

$$\text{board feet} = \frac{10 \times 2 \text{ in.} \times 4 \text{ in.} \times 12 \text{ ft}}{12} = 80 \text{ bd ft}$$

44. $$\text{board feet} = \frac{\text{number of boards} \times \text{thickness (in in.)} \times \text{width (in in.)} \times \text{length (in ft)}}{12}$$

$$\text{board feet} = \frac{24 \times 4 \text{ in.} \times 4 \text{ in.} \times 16 \text{ ft}}{12} = 512 \text{ bd ft}$$

45. $$\text{board feet} = \frac{\text{number of boards} \times \text{thickness (in in.)} \times \text{width (in in.)} \times \text{length (in ft)}}{12}$$

$$\text{board feet} = \frac{175 \times 1 \text{ in.} \times 8 \text{ in.} \times 14 \text{ ft}}{12} = 1633\frac{1}{3} \text{ bd ft}$$

46. $$8 \times 5\frac{3}{4} \text{ in.} = 8 \times \frac{23}{4} \text{ in.} = 46 \text{ in.}$$

47. $$\begin{aligned} 4\frac{9}{32} \text{ in.} - 2 \times \frac{7}{32} \text{ in.} &= 4\frac{9}{32} \text{ in.} - \frac{14}{32} \text{ in.} \\ &= 3\frac{41}{32} \text{ in.} - \frac{14}{32} \text{ in.} \\ &= 3\frac{27}{32} \text{ in.} \end{aligned}$$

48. There will be 8 spaces between the rivets.

$$\begin{aligned} 8 \times 2\frac{5}{16} \text{ in.} &= 8 \times \frac{37}{16} \text{ in.} \\ &= \frac{37}{2} \text{ in.} = 18\frac{1}{2} \text{ in.} \end{aligned}$$

49. There will be 15 spaces between the rivets.

$$\begin{aligned} \frac{28\frac{1}{8} \text{ in.}}{15} &= 28\frac{1}{8} \text{ in.} \times \frac{1}{15} \\ &= \frac{15}{8} \text{ in.} = 1\frac{7}{8} \text{ in.} \end{aligned}$$

50. $$\begin{aligned} &\frac{1}{2} \times 12\frac{5}{8} \text{ in.} + 5\frac{3}{4} \text{ in.} + \frac{1}{2} \times 15\frac{9}{16} \text{ in.} \\ &= \frac{1}{2} \times \frac{101}{8} \text{ in.} + \frac{23}{4} \text{ in.} + + \frac{1}{2} \times \frac{249}{16} \text{ in.} \\ &= \frac{101}{16} \text{ in.} + \frac{23}{4} \text{ in.} + \frac{249}{32} \text{ in.} \\ &= \frac{202}{32} \text{ in.} + \frac{184}{32} \text{ in.} + \frac{249}{32} \text{ in.} \\ &= \frac{635}{32} \text{ in.} = 19\frac{27}{32} \text{ in.} \end{aligned}$$

51. There will be $3+2+6+1=12$ cuts.

Total lengths of the pieces:

$$3\times 2\frac{1}{8}\text{ in.} = 6\frac{3}{8}\text{ in.}$$
$$2\times 5\frac{3}{4}\text{ in.} = 11\frac{1}{2}\text{ in.}$$
$$6\times\frac{7}{8}\text{ in.} = 5\frac{1}{4}\text{ in.}$$
$$1\times 3\frac{1}{2}\text{ in.} = 3\frac{1}{2}\text{ in.}$$
$$12\times\frac{1}{16}\text{ in.} = \frac{3}{4}\text{ in.}$$

Remaining length:

$$36\text{ in.} = 36\text{ in.}$$
$$-6\frac{3}{8}\text{ in.} = -6\frac{3}{8}\text{ in.}$$
$$-11\frac{1}{2}\text{ in.} = -11\frac{4}{8}\text{ in.}$$
$$-5\frac{1}{4}\text{ in.} = -5\frac{2}{8}\text{ in.}$$
$$-3\frac{1}{2}\text{ in.} = -3\frac{4}{8}\text{ in.}$$
$$-\frac{3}{4}\text{ in.} = -\frac{6}{8}\text{ in.}$$
$$= \frac{69}{8}\text{ in.} = 8\frac{5}{8}\text{ in.}$$

52. a. $2\text{ ft }6\text{ in.} = 30\text{ in.}$

$$\frac{30\text{ in.}}{2\frac{1}{2}\text{ in.}} = \frac{30\text{ in.}}{\frac{5}{2}\text{ in.}} = 30\times\frac{2}{5} = 12\text{ pins}$$

b. $2\frac{1}{2}\text{ in.} + \frac{1}{16}\text{ in.} = 2\frac{8}{16}\text{ in.} + \frac{1}{16}\text{ in.}$

$$= 2\frac{9}{16}\text{ in.}$$
$$\frac{30\text{ in.}}{2\frac{9}{16}\text{ in.}} = \frac{30\text{ in.}}{\frac{41}{16}\text{ in.}}$$
$$= 30\times\frac{16}{41}$$
$$= \frac{480}{41} = 11\frac{29}{41}\text{ or 11 pins}$$

53. $$\text{Number of revolutions} = \frac{9\frac{9}{64}\text{ in.}}{\frac{3}{128}\text{ in.}}$$
$$= \frac{\frac{585}{64}\text{ in.}}{\frac{3}{128}\text{ in.}}$$
$$= \frac{585}{64}\times\frac{128}{3}$$
$$= 390\text{ revolutions}$$
$$\text{Time} = 390\text{ revolutions}\times\frac{1\text{ min}}{45\text{ revolutions}}$$
$$= \frac{26}{3}\text{ min} = 8\frac{2}{3}\text{ min}$$

54. $$\frac{318\text{ in.}}{4} = \frac{159}{2}\text{ in.} = 79\frac{1}{2}\text{ in.}$$

55. $V = lwh$

$$V = (4\text{ ft})\left(2\frac{2}{3}\text{ ft}\right)\left(\frac{1}{4}\text{ ft}\right)$$
$$= (4\text{ ft})\left(\frac{8}{3}\text{ ft}\right)\left(\frac{1}{4}\text{ ft}\right)$$
$$= \frac{8}{3}\text{ ft}^3 = 2\frac{2}{3}\text{ ft}^3$$

56. $$6\text{ ft}\times\frac{12\text{ in.}}{1\text{ ft}} = 72\text{ in.}$$
$$\frac{72\text{ in.}}{5\frac{1}{4}\text{ in.}} = \frac{72}{\frac{21}{4}}$$
$$= 72\times\frac{4}{21}$$
$$= \frac{96}{7} = 13\frac{5}{7}\text{ or 13 lengths}$$

57. $$\frac{7\frac{1}{2}\text{ h}}{6} = \frac{\frac{15}{2}\text{ h}}{6}$$
$$= \frac{15}{2}\text{ h} \times \frac{1}{6}$$
$$= \frac{5}{4}\text{ h} = 1\frac{1}{4}\text{ h}$$

58. $$11\text{ cars} \times \frac{3}{4}\text{ h/car} = \frac{33}{4}\text{ h} = 8\frac{1}{4}\text{ h}$$

59. $$\text{Power} = (\text{voltage}) \times (\text{current})$$
$$\text{Power} = 12\frac{1}{2} \times 220$$
$$= \frac{25}{2} \times 220$$
$$= 2750\text{ W}$$

60. $V = IR$
$$V = 4\frac{1}{4} \times 24\frac{1}{2}$$
$$= \frac{17}{4} \times \frac{49}{2} = \frac{833}{8} = 104\frac{1}{8}\text{ V}$$

61. $V = I^2R$
$$V = \left(3\frac{3}{4}\right)^2 \times 5\frac{1}{3}$$
$$= \left(\frac{15}{4}\right)^2 \times \frac{16}{3}$$
$$= \frac{225}{16} \times \frac{16}{3} = \frac{225}{3} = 75\text{ W}$$

65. a. There will be 6 spaces between the outlets.
$$\frac{43\frac{1}{2}\text{ ft}}{6} = \frac{\frac{87}{2}\text{ ft}}{6}$$
$$= \frac{87}{2}\text{ ft} \times \frac{1}{6} = 7\frac{1}{4}\text{ ft or 7 ft 3 in.}$$

b. $$43\frac{1}{2}\text{ ft} + 2\left(\frac{3.0\text{ in.}}{2}\right) = 43\text{ ft }6\text{ in.} + 3\text{ in.}$$
$$= 43\text{ ft }9\text{ in.}$$

c. There are 3 spaces between the outlets.
$$3(7\text{ ft }3\text{ in.}) + \frac{3\text{ in.}}{2} = 21\text{ ft }9\text{ in.} + 1.5\text{ in.}$$
$$= 21\text{ ft }10.5\text{ in.}$$

62. $$12 \times 8\frac{1}{2}\text{ ft} = 102\text{ ft}$$
$$7 \times 18\frac{1}{2}\text{ ft} = 129\frac{1}{2}\text{ ft}$$
$$24 \times 1\frac{3}{4}\text{ ft} = 42\text{ ft}$$
$$12 \times 6\frac{1}{2}\text{ ft} = 78\text{ ft}$$
$$2 \times 34\frac{1}{4}\text{ ft} = 68\frac{1}{2}\text{ ft}$$
$$= 420\text{ ft}$$

63. $$\text{Current} = (\text{voltage}) \div (\text{resistance})$$
$$\text{Current} = 24 \div 10\frac{1}{2}$$
$$= 24 \div \frac{21}{2}$$
$$= 24 \times \frac{2}{21} = \frac{16}{7}\text{ A} = 2\frac{2}{7}\text{ A}$$

64. There will be 77 lengths of wire and $\frac{13}{31} \times \frac{31}{8}\text{ in.} = \frac{13}{8}\text{ in.} = 1\frac{5}{8}\text{ in. remaining.}$
$$\frac{25\text{ ft} \times \frac{12\text{ in.}}{1\text{ ft}}}{3\frac{7}{8}\text{ in.}} = \frac{300\text{ in.}}{\frac{31}{8}\text{ in.}}$$
$$= 300 \times \frac{13}{31}$$
$$= 77\frac{13}{31}$$

66. $$120\text{ acres} \times 1\frac{3}{4}\text{ gal/acres}$$
$$= 120\text{ acres} \times \frac{7}{4}\text{ gal/acres}$$
$$= 210\text{ gal}$$

67. $$\frac{60\text{ gal}}{\frac{3}{4}\text{ gal}} = 60 \times \frac{4}{3} = 80$$
$$80 \times \frac{1}{2}\text{ lb} = 40\text{ lb}$$

68. $$\frac{500 \text{ lb}}{22\frac{1}{2} \text{ lb}} = \frac{500}{\frac{45}{2}}$$
$$= 500 \times \frac{2}{45}$$
$$= \frac{200}{9} \text{ ft}^3 = 22\frac{2}{9} \text{ ft}^3$$

$$15 \text{ tons} = 15 \text{ tons} \times \frac{2000 \text{ lb}}{1 \text{ ton}} = 30,000 \text{ lb}$$

$$\frac{30,000 \text{ lb}}{22\frac{1}{2} \text{ lb}} = \frac{30,000}{\frac{45}{2}}$$
$$= 30,000 \times \frac{2}{45}$$
$$= \frac{4000}{3} \text{ ft}^3 = 1333\frac{1}{3} \text{ ft}^3$$

69. $$\frac{448 \text{ lb} \times \frac{1 \text{ bu}}{56 \text{ lb}}}{\frac{1}{20} \text{ acre}} = \frac{8 \text{ bu}}{\frac{1}{20} \text{ acre}}$$
$$= \frac{8}{\frac{1}{20}} \text{ bu/acre}$$
$$= 8 \times 20 \text{ bu/acre}$$
$$= 160 \text{ bu/acre}$$

70. a. Gravel: $V = lwh$

$$V = 120 \text{ ft} \times 180 \text{ ft} \times 4 \text{ in.} \times \frac{1 \text{ ft}}{12 \text{ in.}} \times \left(\frac{1 \text{ yd}}{3 \text{ ft}}\right)^3$$
$$= \frac{800}{3} \text{ yd}^3 = 266\frac{2}{3} \text{ yd}^3$$

Concrete: $V = lwh$

$$V = 120 \text{ ft} \times 180 \text{ ft} \times 3\frac{1}{2} \text{ in.} \times \frac{1 \text{ ft}}{12 \text{ in.}} \times \left(\frac{1 \text{ yd}}{3 \text{ ft}}\right)^3$$
$$= \frac{700}{3} \text{ yd}^3 = 233\frac{1}{3} \text{ yd}^3$$

b. $$\text{Concrete cost} = 233\frac{1}{3} \text{ yd}^3 \times \$94/\text{yd}^3 = \$21,933.33$$

$$\text{Gravel cost} = 266\frac{2}{3} \text{ yd}^3 \times \frac{2500 \text{ lb}}{1 \text{ yd}^3} \times \frac{1 \text{ ton}}{2000 \text{ lb}} \times \$14/\text{ton} = \$4666.67$$

$$\text{Total cost} = \$21,933.33 + \$4666.67 = \$26,600$$

71. $$\frac{1}{5} \times 2\frac{1}{2} \text{ lb} = \frac{1}{5} \times \frac{5}{2} \text{ lb}$$
$$= \frac{1}{2} \text{ oz}$$

72. $$\frac{45 \text{ mg}}{10 \text{ mg}} = \frac{9}{2} \text{ tablets} = 4\frac{1}{2} \text{ tablets}$$

73. $$\frac{15 \text{ mg}}{30 \text{ mg}} = \frac{1}{2} \text{ tablet}$$

74. $$\frac{45 \text{ mg}}{30 \text{ mg}} = \frac{3}{2} \text{ tablets} = 1\frac{1}{2} \text{ tablets}$$

75. $$2 \times 7\frac{1}{4} \text{ lb} = 2 \times \frac{29}{4} \text{ lb}$$
$$= \frac{58}{4} \text{ lb}$$
$$= \frac{29}{2} \text{ lb} = 14\frac{1}{2} \text{ lb}$$

76. $$\frac{1}{20} \times 7\frac{1}{2} \text{ lb} = \frac{1}{20} \times \frac{15}{2} \text{ lb}$$
$$= \frac{3}{8} \text{ lb}$$

77. $$\frac{12 \text{ oz}}{\frac{1}{2} \text{ oz}} = 12 \times \frac{2}{1} = 24 \text{ doses}$$

78. $$3 \times 2\frac{1}{2} \text{ oz} = 3 \times \frac{5}{2} \text{ oz}$$
$$= \frac{15}{2} \text{ oz}$$
$$= 7\frac{1}{2} \text{ oz}$$

79. $$5 \times \frac{1}{2} \text{ tsp} = \frac{5}{2} \text{ tsp}$$
$$= 2\frac{1}{2} \text{ tsp}$$

80. $$6 \times 6\frac{1}{8} \text{ in.} + 5 \times \frac{1}{4} \text{ in.}$$
$$= 6 \times \frac{49}{8} \text{ in.} + 5 \times \frac{1}{4} \text{ in.}$$
$$= \frac{147}{4} \text{ in.} + \frac{5}{4} \text{ in.}$$
$$= \frac{152}{4} \text{ in.} = 38 \text{ in.}$$

81. a. $$\frac{3 \text{ in.} - 1\frac{1}{2} \text{ in.}}{2} = \frac{1\frac{1}{2} \text{ in.}}{2}$$
$$= \frac{\frac{3}{2} \text{ in.}}{2}$$
$$= \frac{3}{2} \text{ in.} \times \frac{1}{2}$$
$$= \frac{3}{4} \text{ in.}$$

b. Area = Outer area − Inner area
$$= 3 \text{ in.} \times 2\frac{3}{4} \text{ in.} - 1\frac{1}{2} \text{ in.} \times 2 \text{ in.}$$
$$= 3 \text{ in.} \times \frac{11}{4} \text{ in.} - \frac{3}{2} \text{ in.} \times 2 \text{ in.}$$
$$= \frac{33}{4} \text{ in}^2 - 3 \text{ in}^2$$
$$= \frac{33}{4} \text{ in}^2 - \frac{12}{4} \text{ in}^2 = \frac{21}{4} \text{ in}^2$$
Volume = Al
$$= \frac{21}{4} \text{ in}^2 \times 12 \text{ in.} = 63 \text{ in}^3$$

82. Length of one cut:
$$3\frac{1}{8} \text{ in.} + \frac{1}{8} \text{ in.}$$
$$= 3\frac{2}{8} \text{ in.} = 3\frac{1}{4} \text{ in.} = \frac{13}{4} \text{ in.}$$
Number of pieces:
$$\frac{36 \text{ in.}}{\frac{13}{4} \text{ in.}} = \frac{36}{1} \times \frac{4}{13}$$
$$= \frac{144}{13} = 11\frac{1}{13}$$
$$= 11 \text{ pieces}$$

83. $$R_T = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}}$$
$$R_T = \frac{1}{\frac{1}{12\,\Omega} + \frac{1}{6\,\Omega}}$$
$$= \frac{1}{\frac{1}{12\,\Omega} + \frac{2}{12\,\Omega}}$$
$$= \frac{1}{\frac{3}{12\,\Omega}} = \frac{12\,\Omega}{3} = 4\,\Omega$$

84. $$R_T = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}}$$
$$R_T = \frac{1}{\frac{1}{40\,\Omega} + \frac{1}{60\,\Omega} + \frac{1}{80\,\Omega}}$$
$$= \frac{1}{\frac{6}{240\,\Omega} + \frac{4}{240\,\Omega} + \frac{3}{240\,\Omega}}$$
$$= \frac{1}{\frac{13}{240\,\Omega}} = \frac{240\,\Omega}{13} = 18\frac{6}{13}\,\Omega$$

85. $$R_T = \frac{1}{\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}+\frac{1}{R_4}}$$
$$R_T = \frac{1}{\frac{1}{6\,\Omega}+\frac{1}{12\,\Omega}+\frac{1}{24\,\Omega}+\frac{1}{48\,\Omega}}$$
$$= \frac{1}{\frac{8}{48\,\Omega}+\frac{4}{48\,\Omega}+\frac{2}{48\,\Omega}+\frac{1}{48\,\Omega}}$$
$$= \frac{1}{\frac{15}{48\,\Omega}} = \frac{48\,\Omega}{15} = 3\frac{3}{15}\,\Omega = 3\frac{1}{5}\,\Omega$$

86. There will be 4 cuts.
$$5\times 18 \text{ in.} + 4\times\frac{1}{8} \text{ in.} = 90 \text{ in.} + \frac{1}{2} \text{ in.}$$
$$= 90\frac{1}{2} \text{ in.}$$
$$= 7 \text{ ft } 6\frac{1}{2} \text{ in.}$$

87. $$\text{Red flowers} = 300\times\frac{1}{4} = 75 \text{ flowers}$$
$$\text{White flowers} = 300\times\frac{3}{4} = 225 \text{ flowers}$$

88. $$\frac{27 \text{ ft}}{1\frac{1}{2} \text{ ft}} = \frac{27}{\frac{3}{2}} = 27\times\frac{2}{3} = 18 \text{ lengths}$$

89. $$\frac{1\frac{1}{2} \text{ cups}}{\frac{1}{4} \text{ cup}} = \frac{\frac{3}{2}}{\frac{1}{4}} = \frac{3}{2}\times\frac{4}{1} = 6 \text{ scoops}$$

90. $$\text{Dough for one pie} = \frac{1}{4} \text{ lb} + \frac{1}{8} \text{ lb}$$
$$= \frac{1}{4} \text{ lb} + \frac{3}{8} \text{ lb}$$
$$\text{Number of pies} = \frac{12 \text{ lb}}{\frac{3}{8} \text{ lb}}$$
$$= 12\times\frac{8}{3} = 32 \text{ pies}$$

91. $$14 \text{ oz}\times\frac{1 \text{ lb}}{16 \text{ oz}} = \frac{14}{16} \text{ lb} = \frac{7}{8} \text{ lb}$$
$$16\frac{1}{4} \text{ lb} - 5\frac{1}{2} \text{ lb} = 15\frac{5}{4} \text{ lb} - 5\frac{2}{4} \text{ lb}$$
$$= 10\frac{3}{4} \text{ lb}$$
$$\frac{10\frac{3}{4} \text{ lb}}{\frac{7}{8} \text{ lb}} = \frac{\frac{43}{4} \text{ lb}}{\frac{7}{8} \text{ lb}}$$
$$= \left(\frac{43}{4}\right)\left(\frac{8}{7}\right)$$
$$= \frac{86}{7} = 12\frac{2}{7}$$
$$\text{Number of whole steaks} = 12$$

92. $$12 \text{ lb}\times\frac{16 \text{ oz}}{1 \text{ lb}} = 192 \text{ oz}$$
$$192 \text{ oz} - 28 \text{ oz} = 164 \text{ oz}$$
$$\frac{164 \text{ oz}}{192 \text{ oz}} = \frac{41}{48}$$
$$= \frac{4\cdot 41}{4\cdot 48} = \frac{41}{48}$$

93. $$10\frac{1}{3} \text{ gal} - 3\times 2\frac{1}{2} \text{ gal}$$
$$= \frac{31}{3} \text{ gal} - 3\times\frac{5}{2} \text{ gal}$$
$$= \frac{31}{3} \text{ gal} - \frac{15}{2} \text{ gal}$$
$$= \frac{62}{6} \text{ gal} - \frac{45}{6} \text{ gal}$$
$$= \frac{17}{6} \text{ gal} = 2\frac{5}{6} \text{ gal}$$

94. $$\frac{5}{8} + \frac{1}{4} = \frac{5}{8} + \frac{2}{8} = \frac{1}{8} \text{ loin remaining}$$
$$\frac{1}{8}\times 3 = \frac{3}{8} \text{ loin for soup}$$

Section 1.9: The U.S. System of Weights and Measures

1. $$3 \text{ ft}\times\frac{12 \text{ in.}}{1 \text{ ft}} + 7 \text{ in.} = 43 \text{ in.}$$

2. $$6 \text{ yd}\times\frac{3 \text{ ft}}{1 \text{ yd}} + 4 \text{ ft} = 22 \text{ ft}$$

3. $5 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}} + 3 \text{ oz} = 83 \text{ oz}$

4. $7 \text{ yd} \times \frac{3 \text{ ft}}{1 \text{ yd}} \times \frac{12 \text{ in.}}{1 \text{ ft}} = 252 \text{ in.}$

$3 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} = 36 \text{ in.}$

$6 \text{ in.} = \underline{6 \text{ in.}}$

$= 294 \text{ in.}$

5. $4 \text{ qt} \times \frac{2 \text{ pt}}{1 \text{ qt}} + 1 \text{ pt} = 9 \text{ pt}$

6. $6 \text{ gal} \times \frac{4 \text{ qt}}{1 \text{ gal}} \times \frac{2 \text{ pt}}{1 \text{ qt}} = 48 \text{ pt}$

$3 \text{ qt} \times \frac{2 \text{ pt}}{1 \text{ qt}} = \underline{6 \text{ pt}}$

$= 54 \text{ pt}$

7. $3 \text{ tbs} \times \frac{3 \text{ tsp}}{1 \text{ tbs}} = 9 \text{ tsp}$

8. $2 \text{ gal} \times \frac{4 \text{ qt}}{1 \text{ gal}} \times \frac{2 \text{ pt}}{1 \text{ qt}} = 16 \text{ pt}$

9. $8 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} = 96 \text{ in.}$

10. $5 \text{ yd} \times \frac{3 \text{ ft}}{1 \text{ yd}} = 15 \text{ ft}$

11. $3 \text{ qt} \times \frac{2 \text{ pt}}{1 \text{ qt}} = 6 \text{ pt}$

12. $4 \text{ mi} \times \frac{5280 \text{ ft}}{1 \text{ mi}} = 21{,}120 \text{ ft}$

13. $96 \text{ in.} \times \frac{1 \text{ ft}}{12 \text{ in.}} = 8 \text{ ft}$

14. $72 \text{ ft} \times \frac{1 \text{ yd}}{3 \text{ ft}} = 24 \text{ yd}$

15. $10 \text{ pt} \times \frac{1 \text{ qt}}{2 \text{ pt}} = 5 \text{ qt}$

16. $54 \text{ in.} \times \frac{1 \text{ ft}}{12 \text{ in.}} = 4\frac{1}{2} \text{ ft}$

17. $88 \text{ oz} \times \frac{1 \text{ 1b}}{16 \text{ oz}} = 5\frac{1}{2} \text{ lb}$

18. $32 \text{ fl oz} \times \frac{1 \text{ cup}}{8 \text{ fl oz}} \times \frac{1 \text{ pt}}{2 \text{ cups}} = 2 \text{ pt}$

19. $14 \text{ qt} \times \frac{1 \text{ gal}}{4 \text{ qt}} = 3\frac{1}{2} \text{ gal}$

20. $3 \text{ bu} \times \frac{4 \text{ pk}}{1 \text{ bu}} = 12 \text{ pk}$

21. $56 \text{ fl oz} \times \frac{1 \text{ cup}}{8 \text{ fl oz}} \times \frac{1 \text{ pt}}{2 \text{ cups}} = 3\frac{1}{2} \text{ pt}$

22. $7040 \text{ ft} \times \frac{1 \text{ mi}}{5280 \text{ ft}} = 1\frac{1}{3} \text{ mi}$

23. $92 \text{ ft} \times \frac{1 \text{ yd}}{3 \text{ ft}} = 30\frac{2}{3} \text{ yd}$

24. $9000 \text{ lb} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 4\frac{1}{2} \text{ tons}$

25. $2 \text{ mi} \times \frac{5280 \text{ ft}}{1 \text{ mi}} \times \frac{1 \text{ yd}}{3 \text{ ft}} = 3520 \text{ yd}$

26. $6000 \text{ fl oz} \times \frac{1 \text{ cup}}{8 \text{ fl oz}} \times \frac{1 \text{ pt}}{2 \text{ cups}} \times \frac{1 \text{ qt}}{2 \text{ pt}} \times \frac{1 \text{ gal}}{4 \text{ qt}} = 46\frac{7}{8} \text{ gal}$

27. $500 \text{ fl oz} \times \frac{1 \text{ cup}}{8 \text{ fl oz}} \times \frac{1 \text{ pt}}{2 \text{ cups}} \times \frac{1 \text{ qt}}{2 \text{ pt}} = 15\frac{5}{8} \text{ qt}$

28. $3 \text{ mi} \times \frac{320 \text{ rods}}{1 \text{ mi}} = 960 \text{ rods}$

29. $\frac{80 \text{ in.}}{12 \text{ in.}} = 6 \text{ r } 8 = 6 \text{ ft } 8 \text{ in.}$

30. $22{,}000 \text{ ft} \times \frac{1 \text{ mi}}{5280 \text{ ft}} = 4\frac{1}{6} \text{ mi}$

31. $12\frac{3}{4} \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} = \frac{51}{4} \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} = 153 \text{ in.}$

32. $15 \times 24 \text{ oz} \times \frac{1 \text{ 1b}}{16 \text{ oz}} = 22\frac{1}{2} \text{ lb}$

33. $144 \text{ fl oz} + 24 \text{ fl oz} + 56 \text{ fl oz} = 224 \text{ fl oz}$

$224 \text{ fl oz} \times \frac{1 \text{ cup}}{8 \text{ fl oz}} \times \frac{1 \text{ pt}}{2 \text{ cups}} \times \frac{1 \text{ qt}}{2 \text{ pt}} = 7 \text{ qt}$

34. $15 \text{ yd} \times \frac{3 \text{ ft}}{1 \text{ yd}} \times \frac{\frac{4}{25} \Omega}{1 \text{ ft}} = 7\frac{1}{5} \Omega$

35. $1 \text{ mi} \times \dfrac{5280 \text{ ft}}{1 \text{ mi}} \times \dfrac{\frac{1}{10}\ \Omega}{1000 \text{ ft}} = \dfrac{66}{125}\ \Omega$

36. $4200 \text{ lb} + 600 \text{ lb} + 5800 \text{ lb} + 1300 \text{ lb} + 2100 \text{ lb} = 14{,}000 \text{ lb}$

$$14{,}000 \text{ lb} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 7 \text{ tons}$$

37. $3\frac{3}{4} \text{ ft} \times 4\frac{2}{3} \text{ ft} = \frac{15}{4} \text{ ft} \times \frac{14}{3} \text{ ft} = \frac{35}{2} \text{ ft}$

$\frac{35}{2} \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} \times \frac{12 \text{ in.}}{1 \text{ ft}} = 2520 \text{ in}^2$

38. a. $72 \text{ in.} + 68 \text{ in.} + 82 \text{ in.} = 222 \text{ in.}$

$$222 \text{ in.} \times \frac{1 \text{ ft}}{12 \text{ in.}} = 18\frac{1}{2} \text{ ft}$$

b. $18\frac{1}{2} \text{ ft} \times \frac{1 \text{ yd}}{3 \text{ ft}} = 6\frac{1}{6} \text{ yd}$

39. a. $2 \text{ mi} \times \dfrac{5280 \text{ ft}}{1 \text{ mi}} = 10{,}560 \text{ ft}$

b. $10{,}560 \text{ ft} \times \dfrac{1 \text{ yd}}{3 \text{ ft}} = 3520 \text{ yd}$

40. a. $17\frac{1}{2} \text{ gal} \times \dfrac{4 \text{ qt}}{1 \text{ gal}} = 70 \text{ qt}$

b. $70 \text{ qt} \times \dfrac{2 \text{ pt}}{1 \text{ qt}} = 140 \text{ pt}$

41. $3 \text{ lb} \times \dfrac{16 \text{ oz}}{1 \text{ lb}} = 48 \text{ oz}$

42. $2200 \dfrac{\text{ft}^3}{\text{min}} \times \dfrac{1 \text{ min}}{60 \text{ s}} = 36\frac{2}{3} \text{ ft}^3/\text{s}$

43. $153 \text{ ft} \times \dfrac{1 \text{ yd}}{3 \text{ ft}} = 51 \text{ yd}$

44. $3 \text{ ft} \times 6 \text{ ft} \times 4 \text{ ft} = 72 \text{ ft}^3$

$72 \text{ ft}^3 \times 62.4 \dfrac{\text{lb}}{\text{ft}^3} \times \dfrac{1 \text{ gal}}{8.34 \text{ lb}} = 538.7 \text{ gal}$

45. $561 \text{ ft} \times \dfrac{1 \text{ chain}}{66 \text{ ft}} = 8\frac{1}{2} \text{ chains}$

46. $12 \text{ fathoms} \times \dfrac{6 \text{ ft}}{1 \text{ fathom}} = 72 \text{ ft}$

47. $15 \text{ drams} \times \dfrac{27\frac{17}{50} \text{ grains}}{1 \text{ dram}} = 410\frac{1}{10} \text{ grains}$

48. $96 \text{ drams} \times \dfrac{1 \text{ oz}}{8 \text{ drams}} = 12 \text{ oz}$

49. $4500 \dfrac{\text{ft}}{\text{h}} \times \dfrac{1 \text{ h}}{60 \text{ min}} = 75 \dfrac{\text{ft}}{\text{min}}$

50. $28 \dfrac{\text{ft}}{\text{s}} \times \dfrac{60 \text{ s}}{1 \text{ min}} = 1680 \dfrac{\text{ft}}{\text{min}}$

51. $1\frac{1}{5} \dfrac{\text{mi}}{\text{s}} \times \dfrac{60 \text{ s}}{1 \text{ min}} = 72 \dfrac{\text{mi}}{\text{min}}$

52. $7200 \dfrac{\text{ft}}{\text{min}} \times \dfrac{1 \text{ min}}{60 \text{ s}} = 120 \dfrac{\text{ft}}{\text{s}}$

53. $40 \dfrac{\text{mi}}{\text{h}} \times \dfrac{5280 \text{ ft}}{1 \text{ mi}} \times \dfrac{1 \text{ h}}{60 \text{ min}} \times \dfrac{1 \text{ min}}{60 \text{ s}}$

$= 58\frac{2}{3} \dfrac{\text{ft}}{\text{s}}$

54. $64 \dfrac{\text{ft}}{\text{s}} \times \dfrac{1 \text{ mi}}{5280 \text{ ft}} \times \dfrac{60 \text{ s}}{1 \text{ min}} \times \dfrac{60 \text{ min}}{1 \text{ h}}$

$= 43\frac{7}{11} \dfrac{\text{mi}}{\text{h}}$

55. $24 \dfrac{\text{in.}}{\text{s}} \times \dfrac{1 \text{ ft}}{12 \text{ in.}} \times \dfrac{60 \text{ s}}{1 \text{ min}} = 120 \dfrac{\text{ft}}{\text{min}}$

56. $36 \dfrac{\text{in.}}{\text{s}} \times \dfrac{1 \text{ ft}}{12 \text{ in.}} \times \dfrac{1 \text{ mi}}{5280 \text{ ft}} \times \dfrac{60 \text{ s}}{1 \text{ min}} \times \dfrac{60 \text{ min}}{1 \text{ h}}$

$= 2\frac{1}{22} \dfrac{\text{mi}}{\text{h}}$

57. $14 \text{ yd } 5 \text{ ft } 34 \text{ in.}$

$= 14 \text{ yd } 7 \text{ ft } 10 \text{ in.}$

$= 16 \text{ yd } 1 \text{ ft } 10 \text{ in.}$

58. $(8 \text{ yd } 1 \text{ ft } 3 \text{ in.}) - (2 \text{ yd } 2 \text{ ft } 6 \text{ in.})$

$= (8 \text{ yd } 0 \text{ ft } 15 \text{ in.}) - (2 \text{ yd } 2 \text{ ft } 6 \text{ in.})$

$= (7 \text{ yd } 3 \text{ ft } 15 \text{ in.}) - (2 \text{ yd } 2 \text{ ft } 6 \text{ in.})$

$= 5 \text{ yd } 1 \text{ ft } 9 \text{ in.}$

59. $3 \times 1.5 \text{ tons} \times \dfrac{2000 \text{ lb}}{1 \text{ ton}} = 9000 \text{ lb}$

60. $34{,}850 \text{ ft}^2 \times \dfrac{1 \text{ acre}}{43{,}560 \text{ ft}^2} = 0.8 \text{ acres}$

61. $4 \text{ rods} \times \dfrac{16.5 \text{ ft}}{1 \text{ rod}} = 66 \text{ ft}$

$\dfrac{66 \text{ ft}}{3 \text{ ft}} = 22 \text{ paces}$

62. $3 \text{ tbs} \times \dfrac{3 \text{ tsp}}{1 \text{ tbs}} = 9 \text{ tsp}$

63. $7 \text{ gal} \times \dfrac{4 \text{ qt}}{1 \text{ gal}} = 28 \text{ qt}$

64. $1\dfrac{1}{4} \text{ gal} \times \dfrac{4 \text{ qt}}{1 \text{ gal}} \times \dfrac{2 \text{ pt}}{1 \text{ qt}} \times \dfrac{2 \text{ cups}}{1 \text{ pt}} \times \dfrac{8 \text{ fl oz}}{1 \text{ cup}} = 160 \text{ fl oz}$

$\dfrac{160 \text{ fl oz}}{1\dfrac{1}{3} \text{ fl oz}} = 120 \text{ servings}$

65. $2 \text{ gal} = 2 \text{ gal}$

$2 \text{ qt} \times \dfrac{1 \text{ gal}}{4 \text{ qt}} = \dfrac{1}{2} \text{ gal}$

$3 \text{ pt} \times \dfrac{1 \text{ qt}}{2 \text{ pt}} \times \dfrac{1 \text{ gal}}{4 \text{ qt}} = \dfrac{3}{8} \text{ gal}$

$\dfrac{1}{2} \text{ gal} = \dfrac{1}{2} \text{ gal}$

$= 3\dfrac{3}{8} \text{ gal}$

Unit 1B Review

1. $\dfrac{9}{15} = \dfrac{3 \cdot 3}{3 \cdot 5} = \dfrac{3}{5}$

2. $\dfrac{48}{54} = \dfrac{2 \cdot 3 \cdot 8}{2 \cdot 3 \cdot 9} = \dfrac{8}{9}$

3. $\dfrac{27}{6} = 4 \text{ r } 3 = 4\dfrac{3}{6} = 4\dfrac{1}{2}$

4. $\dfrac{(3 \times 5) + 2}{5} = \dfrac{17}{5}$

5. $\dfrac{5}{6} + \dfrac{2}{3} = \dfrac{5}{6} + \dfrac{4}{6} = \dfrac{9}{6} = \dfrac{3}{2} = 1\dfrac{1}{2}$

6. $5\dfrac{3}{8} - 2\dfrac{5}{12}$

$= 5\dfrac{9}{24} - 2\dfrac{10}{24}$

$= 4\dfrac{33}{24} - 2\dfrac{10}{24}$

$2\dfrac{23}{24}$

7. $\dfrac{4}{15}$

8. $\dfrac{3}{4} \div 1\dfrac{5}{8}$

$= \dfrac{3}{4} \div \dfrac{13}{8}$

$= \dfrac{3}{4} \times \dfrac{8}{13}$

$= \dfrac{6}{13}$

9. $1\dfrac{2}{3} + 3\dfrac{5}{6} - 2\dfrac{1}{4}$

$= 1\dfrac{8}{12} + 3\dfrac{10}{12} - 2\dfrac{3}{12}$

$= 4\dfrac{18}{12} - 2\dfrac{3}{12}$

$= 2\dfrac{15}{12} = 3\dfrac{3}{12} = 3\dfrac{1}{4}$

10. $4\frac{2}{3} \div 3\frac{1}{2} \times 1\frac{1}{2}$

$= \frac{14}{3} \div \frac{7}{2} \times \frac{3}{2}$

$= \frac{14}{3} \times \frac{2}{7} \times \frac{3}{2}$

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

$= 2$

11. $7 \text{ in.} - 1\frac{7}{8} \text{ in.} - 1\frac{1}{2} \text{ in.} - 1\frac{1}{3} \text{ in.} - 1\frac{5}{12} \text{ in.}$

$= 7 \text{ in.} - 1\frac{21}{24} \text{ in.} - 1\frac{12}{24} \text{ in.} - 1\frac{8}{24} \text{ in.} - 1\frac{10}{24} \text{ in.}$

$= 7 \text{ in.} - 4\frac{51}{24} \text{ in.}$

$= 6\frac{24}{24} \text{ in.} - 6\frac{4}{24} \text{ in.}$

$= \frac{21}{24} \text{ in.} = \frac{7}{8} \text{ in.}$

12. $72 \text{ in.} - 16\frac{3}{4} \text{ in.} - 24\frac{7}{8} \text{ in.} - 12\frac{5}{16} \text{ in.} - 3 \times \frac{1}{16} \text{ in.}$

$= 72 \text{ in.} - 16\frac{12}{16} \text{ in.} - 24\frac{14}{16} \text{ in.} - 12\frac{5}{16} \text{ in.} - \frac{3}{16} \text{ in.}$

$= 72 \text{ in.} - 16\frac{12}{16} \text{ in.} - 24\frac{14}{16} \text{ in.} - 12\frac{5}{16} \text{ in.} - \frac{3}{16} \text{ in.}$

$= 72 \text{ in.} - 53\frac{34}{24} \text{ in.}$

$= 71\frac{24}{24} \text{ in.} - 54\frac{10}{24} \text{ in.}$

$= 16\frac{14}{24} \text{ in.} = 17\frac{7}{8} \text{ in.}$

13. $P = 2l + 2w$

$P = 2\left(6\frac{1}{4} \text{ in.}\right) + 2\left(2\frac{2}{3} \text{ in.}\right)$

$= 2\left(\frac{25}{4} \text{ in.}\right) + 2\left(\frac{8}{3} \text{ in.}\right)$

$= \frac{25}{2} \text{ in.} + \frac{16}{3} \text{ in.}$

$= \frac{75}{6} \text{ in.} + \frac{32}{6} \text{ in.}$

$= \frac{107}{6} \text{ in.} = 17\frac{5}{6} \text{ in.}$

14. $A = lw$

$A = \left(6\frac{1}{4} \text{ in.}\right)\left(2\frac{2}{3} \text{ in.}\right)$

$= \left(\frac{25}{4} \text{ in.}\right)\left(\frac{8}{3} \text{ in.}\right)$

$= \frac{50}{3} \text{ in}^2 = 16\frac{2}{3} \text{ in}^2$

15. $4 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} = 48 \text{ in.}$

16. $24 \text{ ft} \times \frac{1 \text{ yd}}{3 \text{ ft}} = 8 \text{ yd}$

17. $3 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}} = 48 \text{ oz}$

18. $20 \text{ qt} \times \frac{1 \text{ gal}}{4 \text{ qt}} = 5 \text{ gal}$

19. $\frac{60 \text{ mi}}{1 \text{ hr}} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \frac{1 \text{ min}}{60 \text{ s}} \times \frac{5280 \text{ ft}}{1 \text{ mi}} = 88 \text{ ft/s}$

20. $14 \text{ ft } 4 \text{ in.} = 13 \text{ ft } 16 \text{ in.}$

$\underline{8 \text{ ft } 8 \text{ in.}} = \underline{8 \text{ ft } 8 \text{ in.}}$

$= 5 \text{ ft } 8 \text{ in.}$

Section 1.10: Addition and Subtraction of Decimal Fractions

1. four thousandths
2. twenty-one thousandths
3. five ten-thousandths
4. seven and one-tenth

5. one and four hundred twenty-one hundred-thousandths
6. one thousand forty-two and seven thousandths
7. six and ninety-two thousandths
8. eight and one thousand four hundred sixty-one ten-thousandths
9. $5.02;\ 5\frac{2}{100}=5\frac{1}{50}$
10. $123.006;\ 123\frac{6}{1999}=123\frac{3}{500}$
11. $71.0021;\ 71\frac{21}{10,000}$
12. $0.065;\ \frac{65}{1000}=\frac{13}{200}$
13. $43.0101;\ 43\frac{101}{10,000}$
14. $0.000563;\ \frac{563}{1,000,000}$
15. 0.375
16. 0.64
17. $0.7\overline{3}$
18. 0.4
19. 0.34
20. $1.\overline{2}$
21. $1.\overline{27}$
22. 5.12
23. $18.\overline{285714}$
24. 15.125
25. $34.\overline{2}$
26. $38.\overline{3}$
27. $\frac{7}{10}$
28. $\frac{6}{10}=\frac{3}{5}$
29. $\frac{11}{100}$
30. $\frac{75}{100}=\frac{3}{4}$
31. $\frac{8425}{10,000}=\frac{337}{400}$
32. $3\frac{14}{100}=3\frac{7}{50}$
33. $10\frac{76}{100}=10\frac{19}{25}$
34. $148\frac{255}{1000}=148\frac{51}{200}$
35. 150.000
36. 207.165
37. 163.204
38. 244.037
39. 86.6
40. 1.58
41. 15.308
42. 123.588
43. 8.68
44. 8.94
45. 4.862
46. 130.09
47. 10.0507
48. 0.92454
49. $6.25\text{ ft}-2.4\text{ ft}-2.4\text{ ft}=1.45\text{ ft},$ so the remaining piece will be $1.45\text{ ft}\times 2.4\text{ ft}.$
50. $10.25\text{ ft}+15.4\text{ ft}+14.1\text{ ft}=39.75\text{ ft}$
51. $2.3\text{ h}+3.1\text{ h}+5.4\text{ h}=10.8\text{ h}$
52. $125.5\text{ mi}+110.3\text{ mi}+97.8\text{ mi}=333.6\text{ mi}$
53. $\frac{3}{8}\text{ in.}-\frac{1}{16}\text{ in.}=\frac{6}{16}\text{ in.}-\frac{1}{16}\text{ in.}$
$=\frac{5}{16}\text{ in.}=0.3125\text{ in.}$
54. $\$17.33+\$11.58+\$11.58=\$40.49$
55. $a=2.69\text{ cm}+1.87\text{ cm}=4.56\text{ cm}$
$b=8.32\text{ cm}-3.45\text{ cm}=4.87\text{ cm}$

56.
$$\begin{array}{r} 3.45 \text{ cm} \\ 1.87 \text{ cm} \\ 4.87 \text{ cm} \\ 2.69 \text{ cm} \\ 8.32 \text{ cm} \\ \underline{4.56 \text{ cm}} \\ 25.76 \text{ cm} \end{array}$$

57.
$$\begin{array}{r} 4.17 \text{ in.} \\ 1.30 \text{ in.} \\ 1.00 \text{ in.} \\ \underline{1.47 \text{ in.}} \\ 7.94 \text{ in.} \end{array}$$

58. $6.573 \text{ in.} - 0.938 \text{ in.} - 0.688 \text{ in.} - 1.313 \text{ in.} - 0.625 \text{ in.} - 1.501 \text{ in.} = 1.508 \text{ in.}$

59. $9.625 \text{ in.} = 9\frac{5}{8} \text{ in.}$

$9\frac{5}{8} \text{ in.} \div 2 = 4\frac{5}{32} \text{ in.} = 4.8125 \text{ in.}$

60. $1.125 \text{ in.} - 0.046 \text{ in.} - 0.046 \text{ in.} = 1.033 \text{ in.}$

61.
$$\begin{array}{r} 0.3 \text{ A} \\ 0.105 \text{ A} \\ 0.45 \text{ A} \\ 0.93 \text{ A} \\ 0.27 \text{ A} \\ \underline{0.55 \text{ A}} \\ 2.605 \text{ A} \end{array}$$

62.
$$\begin{array}{r} 21.5\ \Omega \\ 42.6\ \Omega \\ 62.3\ \Omega \\ 19.8\ \Omega \\ \underline{32.2\ \Omega} \\ 178.4\ \Omega \end{array}$$

63.
$$\begin{array}{r} 15.7\ \Omega \\ 40\ \Omega \\ 25.5\ \Omega \\ 0.6\ \Omega \\ 1200\ \Omega \\ \underline{115\ \Omega} \\ 1396.8\ \Omega \end{array}$$

64.
$$\begin{array}{r} 3.2 \text{ V} \\ 5.1 \text{ V} \\ 0.45 \text{ V} \\ 0.03 \text{ V} \\ 0.8 \text{ V} \\ 0.007 \text{ V} \\ \underline{2 \text{ V}} \\ 11.587 \text{ V} \end{array}$$

65. $1.625 \text{ in.} - 1.093 \text{ in.} = 0.532 \text{ in.}$

66. $a = 13.47 \text{ cm} - 6.74 \text{ cm} - 4.89 \text{ cm}$
$= 1.84 \text{ cm}$
$b = 1.23 \text{ cm} + 1.79 \text{ cm}$
$= 3.02 \text{ cm}$
$c = (2.62 \text{ cm} - 0.98 \text{ cm}) \div 2$
$= 0.82 \text{ cm}$

67. $(1.94 \text{ in.} - 1.50 \text{ in.}) \div 2 = 0.22 \text{ in.}$

68. $l = 2.375 \text{ in.} + 3.375 \text{ in.}$
$= 5.75 \text{ in.}$
$A = 1.250 \text{ in.} + 3.750 \text{ in.} + 1.250 \text{ in.}$
$= 6.25 \text{ in.}$

69. $4.125 \text{ in.} - 0.007 \text{ in.} = 4.118 \text{ in.}$

70. $0.2573 \text{ in.} - 0.2476 \text{ in.} = 0.0097 \text{ in.}$

71. $11.2 \text{ billion} - 7.4 \text{ billion} = 3.8 \text{ billion}$

72. $\$114.57 + \$145.36 + \$99.21 = \$359.14$

73. a. 1430.2 bbl

b. $1697.6 \text{ bbl} - 1430.2 \text{ bbl} = 267.4 \text{ bbl}$

74. $2\frac{1}{3} \text{ qt} + 1\frac{1}{6} \text{ qt} + 3\frac{1}{4} \text{ qt}$
$= 2\frac{4}{12} \text{ qt} + 1\frac{2}{12} \text{ qt} + 3\frac{3}{12} \text{ qt}$
$= 6\frac{9}{12} \text{ qt} = 6\frac{3}{4} \text{ qt} = 6.75 \text{ qt}$

75. $1\frac{3}{4}\text{ gal} + 0.4\text{ gal} + 0.75\text{ gal} + 0.5\text{ gal}$
$= 1.75\text{ gal} + 0.4\text{ gal} + 0.75\text{ gal} + 0.5\text{ gal}$
$= 3.4\text{ gal}$

76.
$$\begin{array}{r} 0.75\text{ oz} \\ 1.3\text{ oz} \\ 2.5\text{ oz} \\ \underline{0.1\text{ oz}} \\ 4.65\text{ oz} \end{array}$$

77. $2.5\text{ lb} = 2.5\text{ lb}$
$12\text{ oz} \div 16\text{ oz/lb} = 0.75\text{ lb}$
$1.5\text{ oz} \div 16\text{ oz/lb} = 0.9375\text{ lb}$
$0.7\text{ lb} = 0.7\text{ lb}$
$14\text{ oz} \div 16\text{ oz/lb} = 0.875\text{ lb}$
$18\text{ oz} \div 16\text{ oz/lb} = \underline{1.125\text{ lb}}$
$= 6.0125\text{ lb}$
$= 6\text{ lb}$

Section 1.11: Rounding Numbers

1. a. 1700
   b. 1650
2. a. 1800
   b. 1760
3. a. 3100
   b. 3130
4. a. 100
   b. 70
5. a. 18,700
   b. 18,680
6. a. 6000
   b. 5970
7. a. 3.1
   b. 3.142
8. a. 0.2
   b. 0.162
9. a. 0.1
   b. 0.57
10. a. 1.0
    b. 0.984
11. a. 0.1
    b. 0.070
12. a. 3.8
    b. 3.765
13. 600; 640; 636; 636.2; 636.18; 636.183
14. 1500; 1450; 1452; 1451.5; 1451.53; 1451.525
15. 17,200; 17,160; 17,159; 17,159.2; 17,159.17; 17,159.167
16. 0; 10; 8; 8.2; 8.17; 8.172
17. 1,543,700; 1,543,680; 1,543,679; N/A; N/A; N/A
18. 41,900; 41,890; 41,892; 41,892.2; 41,892.16; 41,892.157
19. 10,600; 10,650; 10,650; 10,649.8; 10,649.83; N/A
20. 100; 80; 84; 84.0; 84.01; 84.007
21. 600; 650; 650; 649.9; 649.90; 649.900
22. 100; 150; 148; 148.0; 148.00; 147.995
23. 237,000
24. 203
25. 0.0328
26. 64,000
27. 72
28. 0.033

29. $1,462,000$
30. 23.23
31. 0.0003376
32. $20,700$
33. 1.01
34. 0.00119

Section 1.12: Multiplication and Division of Decimal Fractions

1. 0.555
2. 23.97
3. 10.5126
4. $27,000$
5. $9,280,000$
6. 634.5
7. 30
8. 3
9. 15
10. 19.4
11. 248.23
12. 5197.37
13. 3676.47
14. 2466.67
15. 7.80
16. 0.984
17. 6.59
18. 72.8

19. $$\frac{8^2-6^2}{4\cdot 8+(7+9)} = \frac{64-36}{32+16} = \frac{28}{48} = \frac{7}{12}$$

20. $$\frac{148-3\cdot 4^2}{5^3-2\cdot 5^2} = \frac{148-3\cdot 16}{125-2\cdot 25} = \frac{148-48}{125-50} = \frac{100}{75} = \frac{4}{3} = 1\frac{1}{3}$$

21. $$\frac{4\cdot 5\cdot 6-5\cdot 2^3}{4^2\cdot 5+5\cdot 2^2} = \frac{20\cdot 6-5\cdot 8}{16\cdot 5+5\cdot 4} = \frac{120-40}{80+20} = \frac{80}{100} = \frac{4}{5}$$

22. $$\frac{2^3+(2+3\cdot 6)^2}{(2\cdot 5-4)^2+3\cdot 5} = \frac{8+(2+18)^2}{(10-4)^2+15} = \frac{8+20^2}{6^2+15} = \frac{8+400}{36+15} = \frac{408}{51} = 8$$

23. $\dfrac{3.6 \text{ ft}}{3} = 1.2 \text{ ft}$
24. $\dfrac{7 \text{ ft}}{4} = 1.75 \text{ ft}$
25. $\dfrac{321.3 \text{ mi}}{2.7 \text{ h}} = 119 \text{ mi/h}$
26. $\dfrac{\$104.06}{24.2 \text{ gal}} = \$4.30/\text{gal}$
27. $\dfrac{475 \text{ mi}}{17.12 \text{ gal}} = 27.7 \text{ mi/gal}$
28. $\dfrac{\$565.40}{4} = \$141.35$

29. $12 \times 8\frac{7}{8} \text{ in.} = 12 \times 8.875 \text{ in.}$
$= 106.5 \text{ in.}$
$\frac{106.5 \text{ in.}}{11} = 9.682 \text{ in.}$

30. $\frac{\$24.96}{4 \text{ ft}} = \$6.24/\text{ft}$
$\$6.24/\text{ft} \times \frac{1 \text{ ft}}{12 \text{ in.}} = \$0.52/\text{in. or } 52¢/\text{in.}$

31. a. $8 \times 4.72 \text{ m} = 37.76 \text{ m}$
b. $2 \times 4.72 \text{ m} = 9.44 \text{ m}$

32. $8 \times 4.75 \text{ mm} = 38.00 \text{ mm}$

33. $n = \frac{1}{p}$
$n = \frac{1}{0.0125}$
$= 80 \text{ threads/in.}$

34. $\frac{78 \text{ ft}}{3.25 \text{ ft}} = 24 \text{ lengths}$

35. $32.63 \text{ in.} - 8 \times 3.56 \text{ in.} - 8 \times 0.15 \text{ in.}$
$= 2.95 \text{ in.}$

36. $32 \times 0.045 \text{ in.} = 1.44 \text{ in.}$

37. $\frac{18 \text{ in.}}{0.0060 \text{ in.}} = 3000 \text{ sheets}$

38. $(45 \text{ ft } 3 \text{ in.})(64 \text{ ft } 6 \text{ in.})$
$= (45.25 \text{ ft})(64.5 \text{ ft})$
$= 2918.625 \text{ ft}^2$

39. $V = lwh$
$V = (87 \text{ ft})(42 \text{ ft})(9 \text{ ft})$
$= 32,886 \text{ ft}^3$
$\text{Cost} = 32,886 \text{ ft}^3 \times \left(\frac{1 \text{ yd}}{3 \text{ ft}}\right)^3 \times \frac{\$39.00}{1 \text{ yd}^3}$
$= \$47,502.00$

40. $\frac{2.640 \text{ in.} - 2.640 \text{ in.}}{0.018 \text{ in.}}$
$= \frac{0.252 \text{ in.}}{0.018 \text{ in.}}$
$= 14 \text{ cuts}$

41. $4.62 \text{ in.} + 7 \times 0.47 \text{ in.} + 6 \times 6.44 \text{ in.} + 4.65 \text{ in.} = 51.20 \text{ in.}$

42. $\frac{\$595}{\$29.75} = 20 \text{ hours}$

43. $6 \times 56.25 \text{ in}^3 = 337.50 \text{ in}^3$

44. $6 \times 0.9 \text{ L} = 5.4 \text{ L}$

45. $\frac{2.0 \text{ L}}{4} = 0.5 \text{ L}$

46. $\frac{318 \text{ in}^3}{8} = 39.75 \text{ in}^3$

47. a. $45,000 \text{ mi} \times \frac{0.062 \text{ in.}}{15,000 \text{ mi}} = 0.186 \text{ in.}$

b. $60,000 \text{ mi} \times \frac{0.062 \text{ in.}}{15,000 \text{ mi}} = 0.248 \text{ in.}$
$\text{Thickness} = 0.375 \text{ in.} - 0.248 \text{ in.}$
$= 0.127 \text{ in.}$

48. $\frac{500 \text{ person h}}{5 \text{ people} \times 8 \text{ h/day}} = 12.5 \text{ days}$

49. $150 \text{ acres} \times 1.6\frac{\text{gal}}{\text{acre}} = 240 \text{ gal}$

50. a. $300 \text{ gal} \times \frac{1.7 \text{ lb}}{10 \text{ gal}} = 51 \text{ lb}$

b. $300 \text{ gal} \times \frac{1 \text{ acre}}{10 \text{ gal}} = 30 \text{ acres}$

51. The cost of one head of cattle is
$550 \text{ lb} \times \$1.45/\text{lb} = \$797.50$.

The revenue of one head of cattle is
$(550 \text{ lb} + 500 \text{ lb}) \times \$1.20/\text{lb} = \$1260.00$.

The expected profit is \$150, so the cost of the weight gain is $\$1260.00 - \$797.50 - \$150.00 = \$312.00$.

The cost of weight gain per pound is
$\frac{\$312.00}{500 \text{ lb}} = \$0.625/\text{lb}$, or 62.5¢/lb.

52. $20 \text{ gal} \times \frac{2 \text{ pt}}{100 \text{ gal}} = 0.4 \text{ pt}$

$60 \text{ gal} \times \frac{2 \text{ pt}}{100 \text{ gal}} = 1.2 \text{ pt}$

$150 \text{ gal} \times \frac{2 \text{ pt}}{100 \text{ gal}} = 3 \text{ pt}$

$350 \text{ gal} \times \frac{2 \text{ pt}}{100 \text{ gal}} = 7 \text{ pt}$

53. $2 \times \pi \times 60 \text{ Hz} \times 0.25 \text{ H} = 94.2 \ \Omega$

54. $2 \times \pi \times 60 \text{ Hz} \times 0.035 \text{ H} = 13.2 \ \Omega$

55. $(6.4 \text{ V})(0.045 \text{ A}) = 0.288 \text{ W}$

56. $(0.95 \text{ V})(0.0065 \text{ A}) = 0.006175 \text{ W}$

57. $\frac{220 \text{ V}}{35.5 \ \Omega} = 6.20 \text{ A}$

58. $\frac{1.5 \text{ V}}{0.25 \text{ A}} = 6 \ \Omega$

59. $\frac{115 \text{ V}}{0.84 \text{ A}} = 136.9 \ \Omega$

60. $\frac{115 \text{ V}}{18 \ \Omega} = 6.39 \text{ A}$

61. $3 \times 0.1 \text{ mg} = 0.3 \text{ mg}$

62. $2 \times 0.25 \text{ g} = 0.5 \text{ g}$

63. $\frac{0.5 \text{ mg}}{0.1 \text{ mg}} = 5 \text{ tablets}$

64. $\frac{1.25 \text{ mg}}{0.25 \text{ mg}} = 5 \text{ tablets}$

65. $350 \text{ mi} \times \frac{0.868 \text{ naut. mi}}{1 \text{ mi}} = 303.8 \text{ naut. mi}$

66. $5 \times 16.0 \text{ A} + 4 \times 13.8 \text{ A} = 135.2 \text{ A}$

67. $4.00 \text{ ft} \times 8.00 \text{ ft} \times 40.32 \frac{\text{lb}}{\text{ft}^2} = 1290 \text{ lb}$

68. $365 \text{ days} \times 4.44 \text{ lb/day} = 1620 \text{ lb}$

69. $316{,}128{,}839 \text{ people} \times 4.4 \text{ lb/person} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 695{,}000 \text{ tons}$

70. $\frac{10{,}240 \text{ ft}^3}{1.2445 \text{ ft}^3/\text{bu}} = 8228 \text{ bu}$

71. $V = lwh$

$V = (4 \text{ ft})(8 \text{ ft})(16 \text{ in.}) \times \frac{1 \text{ ft}}{12 \text{ in.}}$

$= \frac{512}{12} \text{ ft}^3 = 42.7 \text{ ft}^3$

72. $3.25 \times 0.25 \text{ gal} = 0.8125 \text{ gal}$

73. $200 \times 1.5 \text{ oz} = 300 \text{ oz}$

$5 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}} = 80 \text{ oz}$

$\frac{300 \text{ oz}}{80 \text{ oz}} = 3.75 \text{ bags}$

74. a. $110 \times 2.2 \text{ oz} = 242 \text{ oz}$

b. $5.5 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}} = 88 \text{ oz}$

$\frac{242 \text{ oz}}{88 \text{ oz}} = 2.75$, so 3 containers

c. $3 \times 88 \text{ oz} - 242 \text{ oz} = 22 \text{ oz}$

Section 1.13: Percent

1. 0.27
2. 0.15
3. 0.06
4. 0.05

5. 1.56
6. 2.32
7. 0.292
8. 0.362
9. 0.087
10. 1.287
11. 9.478
12. 0.6829
13. 0.0028
14. 0.0078
15. 0.00068
16. 0.000093
17. $4\frac{1}{4}\% = 4.25\% = 0.0425$
18. $9\frac{1}{2}\% = 9.5\% = 0.095$
19. $\frac{3}{8}\% = 0.375\% = 0.00375$
20. $50\frac{1}{3}\% = 50.\overline{3}\% = 0.50\overline{3}$
21. 54%
22. 25%
23. 8%
24. 2%
25. 62%
26. 79%
27. 217%
28. 34.5%
29. 435%
30. 22.5%
31. 18.5%
32. 625%
33. 29.7%
34. 711%
35. 519%
36. 81.5%
37. 1.87%
38. 3.42%
39. 0.29%
40. 0.062%
41. $\frac{4}{5} = 0.8 = 80\%$
42. $\frac{3}{4} = 0.75 = 75\%$
43. $\frac{1}{8} = 0.125 = 12\frac{1}{2}\%$ or 12.5%
44. $\frac{2}{5} = 0.4 = 40\%$
45. $\frac{1}{6} = 0.16 \text{ r } 4 = 16\frac{4}{6}\% = 16\frac{2}{3}\%$
46. $\frac{1}{3} = 0.33 \text{ r } 1 = 33\frac{1}{3}\%$
47. $\frac{4}{9} = 0.44 \text{ r } 4 = 44\frac{4}{9}\%$
48. $\frac{3}{7} = 0.42 \text{ r } 6 = 42\frac{6}{7}\%$
49. $\frac{3}{5} = 0.60 = 60\%$
50. $\frac{5}{6} = 0.83 \text{ r } 2 = 83\frac{2}{6}\% = 83\frac{1}{3}\%$
51. $\frac{13}{40} = 0.325 = 32.5\%$ or $32\frac{1}{2}\%$
52. $\frac{17}{50} = 0.34 = 34\%$
53. $\frac{7}{16} = 0.4375 = 43.75\%$ or $43\frac{3}{4}\%$
54. $\frac{15}{16} = 0.9375 = 93.75\%$ or $93\frac{3}{4}\%$
55. $\frac{96}{40} = 2.40 = 240\%$
56. $\frac{100}{16} = 6.25 = 625\%$

57. $1\frac{3}{4} = 1.75 = 175\%$

58. $2\frac{1}{3} = \frac{7}{3} = 2.33 \text{ r } 1 \ = 233\frac{1}{3}\%$

59. $2\frac{5}{12} = \frac{29}{12} = 2.41 \text{ r } 8 \ = 241\frac{8}{12}\% = 241\frac{2}{3}\%$

60. $5\frac{3}{8} = 5.375 \ = 537.5\% \text{ or } 537\frac{1}{2}\%$

61. $75\% = \frac{75}{100} = \frac{3}{4}$

62. $45\% = \frac{45}{100} = \frac{9}{20}$

63. $16\% = \frac{16}{100} = \frac{4}{25}$

64. $80\% = \frac{80}{100} = \frac{4}{5}$

65. $60\% = \frac{60}{100} = \frac{3}{5}$

66. $15\% = \frac{15}{100} = \frac{3}{20}$

67. $93\% = \frac{93}{100}$

68. $32\% = \frac{32}{100} = \frac{8}{25}$

69. $275\% = \frac{275}{100} = \frac{11}{4} = 2\frac{3}{4}$

70. $325\% = \frac{325}{100} = \frac{13}{4} = 3\frac{1}{4}$

71. $125\% = \frac{125}{100} = \frac{5}{4} = 1\frac{1}{4}$

72. $150\% = \frac{150}{100} = \frac{3}{2} = 1\frac{1}{2}$

73. $10\frac{3}{4}\% = \frac{43}{4}\% = \frac{43}{4} \times \frac{1}{100} = \frac{43}{400}$

74. $13\frac{2}{5}\% = \frac{67}{5}\% = \frac{67}{5} \times \frac{1}{100} = \frac{67}{500}$

75. $10\frac{7}{10}\% = \frac{107}{10}\% = \frac{107}{10} \times \frac{1}{100} = \frac{107}{1000}$

76. $40\frac{7}{20}\% = \frac{807}{20}\% = \frac{807}{20} \times \frac{1}{100} = \frac{807}{2000}$

77. $17\frac{1}{4}\% = \frac{69}{4}\% = \frac{69}{4} \times \frac{1}{100} = \frac{69}{400}$

78. $6\frac{1}{3}\% = \frac{19}{3}\% = \frac{19}{3} \times \frac{1}{100} = \frac{19}{300}$

79. $16\frac{1}{6}\% = \frac{97}{6}\% = \frac{97}{6} \times \frac{1}{100} = \frac{97}{600}$

80. $72\frac{1}{8}\% = \frac{577}{8}\% = \frac{577}{8} \times \frac{1}{100} = \frac{577}{800}$

81.

Fraction	Decimal	Percent
$\frac{3}{8}$	0.375	37.5%
$\frac{45}{100} = \frac{9}{20}$	0.45	45%
$\frac{18}{100} = \frac{9}{50}$	0.18	18%
$1\frac{2}{5}$	1.4	140%
$1\frac{8}{100} = 1\frac{2}{25}$	1.08	108%
$\frac{1675}{1000} = \frac{67}{40}$	0.1675	$16\frac{3}{4}\%$

Section 1.14: Rate, Base, and Part

1. $P = 60$; $R = 25\%$; $B = 240$
2. $P = \$100$; $R = 33\frac{1}{3}\%$; $B = \$300$
3. $P = 108$; $R = 40\%$; $B = 270$
4. $P = 72$; $R = 15\%$; $B = 480$
5. $P =$ unknown; $R = 4\%$; $B = 28,000$
6. $P = 25$; $R =$ unknown; $B = 28$
7. $P = 21$; $R = 60\%$; $B =$ unknown
8. $P =$ unknown; $R = 10\%$; $B = 15,000$
9. $P = 2050$; $R = 6\%$; $B =$ unknown
10. $P = \$40$; $R =$ unknown; $B = \$500$

11. $P = BR$
$P = (\$32,500)(0.08)$
$= \$2600$

Her new salary is $\$32,500 + \$2600 = \$35,100$.

12. $P = BR$
$P = (\$2870)(0.06)$
$= \$172.20$

His new monthly salary is $\$2870 + \$172.20 = \$3042.20$ so his new annual salary is $12 \times \$3042.20 = \$36,506.40$.

13. a. 10%; $\$5.49 + \$3.28 + \$7.22 + \$2.12 = \$18.11$
$\$18.11 - 0.10 \times \$18.11 = \$16.30$
20%; $\$12.57 + \$22.12 + \$17.88 = \$52.57$
$\$52.57 - 0.20 \times \$52.57 = \$42.06$
30%; $\$38.42 + \$40.12 + \$35.18 = \$113.72$
$\$113.72 - 0.30 \times \$113.72 = \$79.60$
Total; $\$16.30 + \$42.06 + \$79.61 = \$137.96$

b. $137.96 + 0.0625 \times 137.96 = \$146.58$

14. $B = \dfrac{P}{R}$
$B = \dfrac{2040}{0.075}$
$= 27,200$

15. $880 \text{ yd} \times \dfrac{3 \text{ ft}}{1 \text{ yd}} = 2650 \text{ ft}$
$R = \dfrac{P}{B}$
$R = \dfrac{2650 \text{ ft}}{5280 \text{ ft}}$
$= 0.5 = 50\%$

16. $B = \dfrac{P}{R}$
$B = \dfrac{0.35 \text{ mi}}{0.04}$
$= 8.75 \text{ mi}$

17. $B = \dfrac{P}{R}$
$B = \dfrac{\$72}{0.045}$
$= \$1600$

18. $R = \dfrac{P}{B}$
$R = \dfrac{3.5}{7.15}$
$= 0.490 = 49.0\%$

19. $P = BR$
$P = (48)(2.35)$
$= 112.8$

20. $R = \dfrac{P}{B}$
$R = \dfrac{\frac{1}{15}}{\frac{1}{8}}$
$= \dfrac{8}{15} = 0.533 = 53.3\%$

21. $P = BR$
$P = (32 \text{ V})(0.28)$
$= 8.96 \text{ V}$

22. $P = BR$
$P = (\$159.95)(0.075)$
$= \$12.00$
$4(\$159.95 + \$12.00 + \$2.50 + \$3.69)$
$= \$712.56$

23. $R = \dfrac{P}{B}$
$R = \dfrac{97}{130}$
$= 0.746 = 74.6\%$

24. $P = BR$

$P = (115 \text{ welds})(0.92)$

$= 106 \text{ welds}$

25. $R = \dfrac{P}{B}$

$R = \dfrac{24 \text{ h}}{65 \text{ h}}$

$= 0.369 = 36.9\%$

26. Total hours $= 1.5 \text{ h} + 0.4 \text{ h} = 1.9 \text{ h}$

$R = \dfrac{P}{B}$

$R = \dfrac{0.4 \text{ h}}{1.9 \text{ h}}$

$= 0.211 = 21.1\%$

27. $R = \dfrac{P}{B}$

$R = \dfrac{0.3 \text{ qt}}{4.5 \text{ qt}}$

$= 0.067 = 6.7\%$

28. $R = \dfrac{P}{B}$

$R = \dfrac{1.5 \text{ lb/h}}{2 \text{ lb/h}}$

$= 0.75 = 75\%$

29. $R = \dfrac{P}{B}$

$R = \dfrac{2400 \text{ ft}^3 - 1920 \text{ ft}^3}{2400 \text{ ft}^3}$

$= \dfrac{480 \text{ ft}^3}{2400 \text{ ft}^3}$

$= 0.20 = 20\%$

30. Window area $= 78\dfrac{1}{2} \text{ ft} \times 12\dfrac{1}{6} \text{ ft} \times 0.20$

$= 191 \text{ ft}^2$

Area of 1 window $= (2 \text{ ft})(6 \text{ ft}) = 12 \text{ ft}^2$

$\dfrac{191 \text{ ft}^2}{12 \text{ ft}^2} = 15.9$

Fifteen windows could be drawn on the wall.

31. $B = \dfrac{P}{R}$

$B = \dfrac{20 \text{ ft}}{0.03}$

$= 666.7 \text{ ft}$

$A = 666.7 \text{ ft} + 100 \text{ ft} = 766.7 \text{ ft}$

32. $66 \text{ ft} \times \dfrac{3}{4} + 3 \text{ in.} = 49 \text{ ft } 6 \text{ in.} + 3 \text{ in.}$

$= 49 \text{ ft } 9 \text{ in.}$

33. Chemical: $160 \text{ acre} \times \dfrac{2\frac{3}{4} \text{ lb}}{1 \text{ acre}} = 440 \text{ lb}$

Active ingredients: $440 \text{ lb} \times 0.80 = 352 \text{ lb}$

Inert ingredients: $440 \text{ lb} - 352 \text{ lb} = 88 \text{ lb}$

34. $60 \text{ lb} \times 0.39 = 23.4 \text{ lb}$

$120 \text{ acre} \times \dfrac{45 \text{ bu}}{1 \text{ acre}} \times \dfrac{23.4 \text{ lb}}{1000 \text{ ft}^2} = 126{,}360 \text{ lb}$

35. $7310 \text{ lb} \times \dfrac{1 \text{ gal}}{8.6 \text{ lb}} = 850 \text{ gal}$

Butterfat $= 850 \text{ gal} \times 0.42 = 35.7 \text{ gal}$

36. Seeded area $= (18{,}400 \text{ ft}^2)(0.60)$

$= 11{,}040 \text{ ft}^2$

Seed required $= 11{,}040 \text{ ft}^2 \times \dfrac{2 \text{ lb}}{1000 \text{ ft}^2}$

$= 22 \text{ lb}$

37. $R = \dfrac{P}{B}$

$R = \dfrac{150 - 39}{150}$

$= 74\%$

38. $P = BR$

$P = (500 \text{ ml})(0.15)$

$= 75 \text{ ml}$

39. $P = BR$

$P = (250 \text{ ml})(0.03)$

$= 7.5 \text{ ml}$

40. $P = BR$

$P = (2000 \text{ ml})(0.0015)$

$= 3 \text{ ml}$

41. $R = \dfrac{P}{B}$

$R = \dfrac{25 \text{ ml}}{1000 \text{ ml}}$

$= 0.025 = 2.5\%$

42. $\text{Percent increase} = \dfrac{\text{change}}{\text{original value}} \times 100\%$

$\text{Percent increase} = \dfrac{128 \text{ V} - 115 \text{ V}}{115 \text{ V}} \times 100\%$

$= 11.3\%$

43. $\text{Percent increase} = \dfrac{\text{change}}{\text{original value}} \times 100\%$

$\text{Percent increase} = \dfrac{115 \text{ lb/in}^2 - 75 \text{ lb/in}^2}{75 \text{ lb/in}^2} \times 100\%$

$= 53.3\%$

44. $\text{Percent decrease} = \dfrac{\text{change}}{\text{original value}} \times 100\%$

$\text{Percent decrease} = \dfrac{\$98,500 - \$79,400}{\$98,500} \times 100\%$

$= 19.4\%$

45. $\text{Percent decrease} = \dfrac{\text{change}}{\text{original value}} \times 100\%$

$\text{Percent decrease} = \dfrac{\$25.50 - \$21.88}{\$25.50} \times 100\%$

$= 14.2\%$

46. $\text{Percent increase} = \dfrac{\text{change}}{\text{original value}} \times 100\%$

$\text{Percent increase} = \dfrac{6500 \text{ ft}^2}{28,000 \text{ ft}^2} \times 100\%$

$= 23.2\%$

47. First item:

$\$100.00 - 0.55 \times \$100.00 = \$45.$

Second item:

$\$100.00 - 0.40 \times \$100.00 = \$60.00$

$\$60.00 - 0.15 \times \$60.00 = \$51.00$

48. $P = BR$

$P = (\$22.15)(0.32)$

$= \$7.09$

$\text{New salary} = \$22.15 + \$7.09 = \$29.24$

49. $P = BR$

$P = (1640 \text{ lb})(0.95)$

$= 1558 \text{ lb}$

50. $R = \dfrac{P}{B}$

$R = \dfrac{59}{125}$

$= 0.472 = 47.2\%$

51. $R = \dfrac{P}{B}$

$R = \dfrac{187}{250}$

$= 0.748 = 74.8\%$

52. $\text{Population} = 135 + 42 - 7 - 3 - 5 - 10$

$= 152$

$\text{Percent increase} = \dfrac{\text{change}}{\text{original value}} \times 100\%$

$\text{Percent increase} = \dfrac{152 - 135}{135} \times 100\%$

$= 12.6\%$

53. a. $P = BR$

$P = \left(25 \text{ deer/mi}^2\right)(0.40)$

$= 10 \text{ deer/mi}^2$

$\text{Population} = 25 \text{ deer/mi}^2 + 10 \text{ deer/mi}^2$

$= 35 \text{ deer/mi}^2$

b. $P = BR$

$P = \left(35 \text{ deer/mi}^2\right)(0.40)$

$= 14 \text{ deer/mi}^2$

$\text{Population} = 35 \text{ deer/mi}^2 + 14 \text{ deer/mi}^2$

$= 49 \text{ deer/mi}^2$

54. a.
$$P = BR$$
$$P = (4.6 \text{ lb})(0.25)$$
$$= 1.15 \text{ lb}$$
$$\text{Average per day} = 4.6 \text{ lb} - 1.15 \text{ lb}$$
$$= 3.45 \text{ lb}$$

b. $$3.45 \text{ lb} \times 75{,}000 \times 365 \times \frac{1 \text{ ton}}{2000 \text{ lb}}$$
$$= 47{,}200 \text{ tons}$$

c. $100\% - 30\% = 70\%$
$$B = \frac{P}{R}$$
$$B = \frac{73{,}500 \text{ tons}}{0.70}$$
$$= 105{,}000 \text{ tons}$$

55. Total cost = \$5.66
$$B = \frac{P}{R}$$
$$B = \frac{\$5.66}{0.34}$$
$$= \$16.65$$

56.
$$P = BR$$
$$P = (70 \text{ lb})(0.17)$$
$$= 11.9 \text{ lb}$$
$$\text{Remaining} = 70 \text{ lb} - 11.9 \text{ lb} = 58.1 \text{ lb}$$

57.

	Total Cost
	$22 \times \$1.33 = \$29.26$
	$14 \times \$3.89 = \$54.46$
	$12 \times \$6.49 = \$77.88$
	$6 \times \$7.43 = \$44.58$
	$6 \times \$8.76 = \$52.56$
	$6 \times \$5.54 = \$33.24$
	$5 \times \$6.45 = \$32.25$
	$4 \times \$2.09 = \$8.36$
	$120 \times \$1.69 = \$202.80$
Subtotal	\$535.39
7.5% Sales Tax	$\$535.39 \times 0.075 = \$40.16$
Labor	$32 \times \$48.00 = \$1536$
Total	\$2111.55
Less 5% Cash Discount Net 30 Days	$\$2111.55 \times 0.05 = \$105.58$
Net Total	$\$2111.55 - 105.58 = \$2005.97$

58. a. Amount for Soybeans : $1495.47 \times \$9.52 = \$14{,}236.87$
Net Amount: $\$14{,}236.87 - \$224.67 - \$72.26 - \$27.73 = \$13{,}912.18$

b. Amount for Corn : $2398.99 \times \$4.23 + 2398.99 \times \$4.23 + 2398.99 \times \$4.23 = \$21{,}377.73$
Net Amount: $\$21{,}377.73 - \$740.67 - \$55.92 - \$ - 320.75 - \$337.54 = \$19{,}922.85$

59.

	$66 \times \$7.97 = \$526.02$
	$30 \times \$3.95 = \$118.50$
	$14 \times \$3.39 = \$47.46$
	$17 \times \$6.59 = \$112.03$
	$9 \times \$5.39 = \$48.51$
	$7 \times \$4.97 = \$34.79$
	$10 \times \$11.97 = \$119.70$
	$6 \times \$16.89 = \$101.34$
	$15 \times \$24.25 = \$363.75$
	$80 \times \$17.29 = \$1383.2$
	$250 \times \$2.18 = \$545$
Subtotal	\$3400.30
Less 2% Discount	$\$3400.30 \times 0.02 = \$68.00$
Subtotal	$\$3400.30 - \$68.00 = \$3332.30$
5 ¾% Sales Tax	$\$3332.30 \times 0.0575 = \$191.61$
NET TOTAL	$\$3332.30 + \$191.61 = \$3523.90$

60.

	Net Price
	$3(\$18.58 - 0.40 \times \$18.58) = \$33.44$
	$5(\$65.10 - 0.25 \times \$65.10) = \$244.13$
	$5(\$73.95 - 0.25 \times \$73.95) = \$277.31$
	$8(\$43.90 - 0.25 \times \$43.90) = \$263.40$
	$2(\$124.60 - 0.20 \times \$124.60) = \$199.36$
	$5(\$18.80 - 0.15 \times \$18.80) = \$79.90$
Subtotal	\$1097.54
Less 5% if paid in 30 days	$\$1097.54 \times 0.05 = \$54.877$
Total	\$1042.66

Section 1.15: Powers and Roots

1. 225
2. 625
3. 222
4. 0.000778
5. 0.00000661
6. $2,940,000,000$
7. 729
8. 2740
9. 562
10. 0.0000114
11. 0.00483
12. $15,300$
13. 157
14. $276,000$
15. 2.96
16. 112
17. 68.9
18. 0.0806
19. 42.4
20. 2.12
21. 0.198
22. 8.78

Section 1.16: Applications Involving Percent: Business and Personal Finance

1. a. $i = prt$

$i = (\$2000)(0.05)(3)$

$= \$300$

b. $\text{payment} = \dfrac{\text{principle} + \text{interest}}{\text{loan period}}$

$\text{payment} = \dfrac{\$2000 + \$300}{36}$

$= \$63.89$

2. $i = prt$

$$i = (\$2500)(0.045)(2)$$
$$= \$225$$

3. $A = P\left(1+\frac{r}{n}\right)^{nt}$

$$A = \$7500\left(1+\frac{0.065}{4}\right)^{(4)(4)}$$
$$= \$7500(1.01625)^{16}$$
$$= \$9706.67$$

4. $A = P\left(1+\frac{r}{n}\right)^{nt}$

$$A = \$10,500\left(1+\frac{0.0575}{2}\right)^{(2)(6)}$$
$$= \$10,500(1.02875)^{12}$$
$$= \$14,753.92$$

5. $A = P\left(1+\frac{r}{n}\right)^{nt}$

$$A = \$15,000\left(1+\frac{0.055}{2}\right)^{(2)(8)}$$
$$= \$15,000(1.0275)^{16}$$
$$= \$23,152.64$$

6. $A = P\left(1+\frac{r}{n}\right)^{nt}$

$$A = \$6000\left(1+\frac{0.075}{4}\right)^{(4)(5)}$$
$$= \$6000(1.01875)^{20}$$
$$= \$8699.69$$

7. $P = \$150,000$

$$i = 0.065/12$$
$$n = 30\times 12 = 360$$
$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$
$$A = \$150,000\left(\frac{\left(\frac{0.065}{12}\right)\left(1+\frac{0.065}{12}\right)^{360}}{\left(1+\frac{0.065}{12}\right)^{360}-1}\right)$$
$$= \$948.10$$

8. $P = \$75,000$

$$i = 0.0625/12$$
$$n = 15\times 12 = 180$$
$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$
$$A = \$75,000\left(\frac{\left(\frac{0.0625}{12}\right)\left(1+\frac{0.0625}{12}\right)^{180}}{\left(1+\frac{0.0625}{12}\right)^{180}-1}\right)$$
$$= \$643.07$$

9. Price $= 275 \text{ acres} \times \$4100/\text{acre}$

$$= \$1,127,500$$
$$P = \$1,127,500\times 0.75 = \$845,625$$
$$i = 0.0675$$
$$n = 20$$
$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$
$$A = \$845,625\left(\frac{0.0675(1+0.0675)^{20}}{(1+0.0675)^{20}-1}\right)$$
$$= \$78,276.71$$

10. $P = \left(\left[\$45,500 - \$4500\right]\right) \times 0.80 = \$32,800$

$i = 0.0725/12$

$n = 5 \times 12 = 60$

$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$

$$A = \$32,800\left(\frac{\left(\frac{0.0725}{12}\right)\left(1+\frac{0.0725}{12}\right)^{60}}{\left(1+\frac{0.0725}{12}\right)^{60} - 1}\right)$$

$= \$653.36$

11. a.

$P = \$24,000$

$i = 0.0075/12$

$n = 3 \times 12 = 36$

$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$

$$A = \$24,000\left(\frac{\left(\frac{0.0075}{12}\right)\left(1+\frac{0.0075}{12}\right)^{36}}{\left(1+\frac{0.0075}{12}\right)^{36} - 1}\right)$$

$= \$674.40$

Total payment $= \$674.40 \times 36 = \$24,278.40$

b.

$P = \$24,000 - \$1500 = \$22,500$

$i = 0.085/12$

$n = 3 \times 12 = 36$

$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$

$$A = \$22,500\left(\frac{\left(\frac{0.0.085}{12}\right)\left(1+\frac{0.0.085}{12}\right)^{36}}{\left(1+\frac{0.0.085}{12}\right)^{36} - 1}\right)$$

$= \$710.27$

Total payment $= \$710.27 \times 36 = \$25,569.71$

Choice a costs $\$25,569.71 - \$24,278.51 = \$1291.20$ less.

12. a. $P = \$19,500$

$i = 0.0175/12$

$n = 3 \times 12 = 36$

$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$

$$A = \$19,500\left(\frac{\left(\frac{0.0175}{12}\right)\left(1+\frac{0.0175}{12}\right)^{36}}{\left(1+\frac{0.0175}{12}\right)^{36} - 1}\right)$$

$= \$556.40$

Total payment $= \$556.40 \times 36 = \$20,030.40$

b. $P = \$19,500 - \$2500 = \$17,000$

$i = 0.065/12$

$n = 3 \times 12 = 36$

$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$

$$A = \$17,000\left(\frac{\left(\frac{0.065}{12}\right)\left(1+\frac{0.065}{12}\right)^{36}}{\left(1+\frac{0.065}{12}\right)^{36} - 1}\right)$$

$= \$521.03$

Total payment $= \$521.03 \times 36 = \$18,757.08$

Choice b costs $\$20,030.57 - \$18,757.19 = \$1273.38$ less.

13. $P = \$220,500 - \$4500 - \$9500 - \$8000 = \$198,500$

$i = 0.08$

$n = 4$

$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$

$$A = \$198,500\left(\frac{(0.08)(1+0.08)^4}{(1+0.08)^4 - 1}\right)$$

$= \$59,931.28$

14. Dealer price $= \$150,500 \times (1 + 0.035 + 0.0095) = \$157,197.25$

$$P = \$157,197.25 - \$7500 - \$10,000 = \$139,697.25$$
$$i = 0.0725$$
$$n = 5$$
$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$
$$A = \$139,697.25\left(\frac{(0.0725)(1+0.0725)^5}{(1+0.0725)^5 - 1}\right)$$
$$= \$34,299.23$$

15. $A = P\left(1 + \frac{r}{n}\right)^{nt}$

$$A = \$30,000\left(1 + \frac{0.05}{1}\right)^{(1)(3)}$$
$$= \$30,000(1.05)^3$$
$$= \$34,728.75$$

16. $A = P\left(1 + \frac{r}{n}\right)^{nt}$

$$A = \$30,000\left(1 + \frac{0.05}{12}\right)^{(12)(3)}$$
$$= \$34,844.17$$

17. $A = P\left(1 + \frac{r}{n}\right)^{nt}$

$$A = \$30,000\left(1 + \frac{0.05}{365}\right)^{(365)(3)}$$
$$= \$34,854.67$$

18. $A = P\left(1 + \frac{r}{n}\right)^{nt}$

$$A = \$30,000\left(1 + \frac{0.05}{52}\right)^{(52)(3)}$$
$$= \$34,852.52$$

19. $A = P\left(1 + \frac{r}{n}\right)^{nt}$

$$A = \$8400\left(1 + \frac{0.035}{12}\right)^{(12)(5)}$$
$$= \$10,003.92$$

20. $A = P\left(1 + \frac{r}{n}\right)^{nt}$

$$A = \$4000\left(1 + \frac{0.055}{52}\right)^{(52)(4)}$$
$$= \$4983.73$$

21. $P = \$37,500 - \$37,500 \times 0.10 + \$37,500 \times 0.06$

$$= \$36,000$$
$$i = 0.042/12 = 0.0035$$
$$n = 3 \times 12 = 36$$
$$A = P\left(\frac{i(1+i)^n}{(1+i)^n - 1}\right)$$
$$A = \$36,000\left(\frac{0.0035(1+0.0035)^{36}}{(1+0.0035)^{36} - 1}\right)$$
$$= \$1066.07$$

22. Discount amount $= (0.02)(\$12,000) = \$240$

$$\text{Interest} = \frac{\text{Discount amount}}{\text{Invoice amount} - \text{Discount amount}} \times \frac{\text{Number of days per year}}{\text{Number of days paid early}}$$

$$\text{Interest} = \frac{\$240}{\$12,000 - \$240} \times \frac{365}{20} = 37.2\%$$

23. Discount amount $= (0.03)(\$15,870) = \$476.10$

$$\text{Interest} = \frac{\text{Discount amount}}{\text{Invoice amount} - \text{Discount amount}} \times \frac{\text{Number of days per year}}{\text{Number of days paid early}}$$

$$\text{Interest} = \frac{\$476.10}{\$15,870 - \$476.10} \times \frac{365}{20} = 56.4\%$$

24. Discount amount $= (0.02)(\$3000) = \$60$

$$\text{Interest} = \frac{\text{Discount amount}}{\text{Invoice amount} - \text{Discount amount}} \times \frac{\text{Number of days per year}}{\text{Number of days paid early}}$$

$$\text{Interest} = \frac{\$60}{\$3000 - \$60} \times \frac{365}{18} = 41.4\%$$

25. Discount amount $= (0.025)(\$129,115.23) = \$3227.88$

$$\text{Interest} = \frac{\text{Discount amount}}{\text{Invoice amount} - \text{Discount amount}} \times \frac{\text{Number of days per year}}{\text{Number of days paid early}}$$

$$\text{Interest} = \frac{\$3227.88}{\$129,115.23 - \$3227.88} \times \frac{365}{20} = 46.8\%$$

26. Discount amount $= (0.02)(\$22,000) = \$440$

$$\text{Interest} = \frac{\text{Discount amount}}{\text{Invoice amount} - \text{Discount amount}} \times \frac{\text{Number of days per year}}{\text{Number of days paid early}}$$

$$\text{Interest} = \frac{\$440}{\$22,000 - \$440} \times \frac{365}{30} = 24.8\%$$

27. Discount amount $= (0.01)(\$21,500) = \$215$

$$\text{Interest} = \frac{\text{Discount amount}}{\text{Invoice amount} - \text{Discount amount}} \times \frac{\text{Number of days per year}}{\text{Number of days paid early}}$$

$$\text{Interest} = \frac{\$215}{\$21,500 - \$215} \times \frac{365}{10} = 36.9\%$$

28. Discount amount $= (0.015)(\$16,000) = \$240$

$$\text{Interest} = \frac{\text{Discount amount}}{\text{Invoice amount} - \text{Discount amount}} \times \frac{\text{Number of days per year}}{\text{Number of days paid early}}$$

$$\text{Interest} = \frac{\$240}{\$16,000 - \$240} \times \frac{365}{20} = 27.8\%$$

Unit 1C Review

1. 1.625

2. $\frac{45}{100} = \frac{9}{20}$

3. 10.129
4. 116.935
5. 5.854
6. $55.6 \text{ ft} - 15.0 \text{ ft} - 15.0 \text{ ft} = 25.6 \text{ ft}$
7. 55.6 ft
   15.0 ft
   15.0 ft
   9.5 ft
   25.6 ft
   9.5 ft
   15.0 ft
   15.0 ft
   160.2 ft
8. a. 45.1
   b. 45.06
9. a. 45.1
   b. 45.06
10. 0.11515
11. 18.85
12. $18.5 \text{ in.} \div 2.75 \text{ in.} = 6 \text{ r } 2$. Six cables could be cut and there would be 2 in. remaining.
13. 0.25
14. 72.4
15. $P = BR$
    $P = (420)(0.165)$
    $= 69.3$
16. $B = \dfrac{P}{R}$
    $B = \dfrac{240}{0.12}$
    $= 2000$
17. $R = \dfrac{P}{B}$
    $R = \dfrac{96 \text{ yd}}{240 \text{ yd}}$
    $= 40.0\%$
18. $P = BR$
    $P = (\$16.50)(0.06)$
    $= \$0.99$

    Her new salary is $\$16.50 + \$0.99 = \$17.49$/h.
19. 2110
20. 9.40

Chapter 1 Review

1. 8243
2. 55,197
3. 9,178,000
4. 226 r 240
5. $12 - 3(5-2)$
   $= 12 - 3(3)$
   $= 12 - 9$
   $= 3$
6. $(6+4)8 \div 2 + 3$
   $= (10)8 \div 2 + 3$
   $= 80 \div 2 + 3$
   $= 40 + 3$
   $= 43$
7. $18 \div 2 \times 5 \div 3 - 6 + 4 \times 7$
   $= 9 \times 5 \div 3 - 6 + 28$
   $= 45 \div 3 - 6 + 28$
   $= 15 - 6 + 28$
   $= 37$
8. $\dfrac{2 \cdot 4^2 + 3(4+5)^2}{10^2 - 3 \cdot 5^2}$
   $= \dfrac{2 \cdot 16 + 3(9)^2}{100 - 3 \cdot 25}$
   $= \dfrac{32 + 3(81)}{100 - 75}$
   $= \dfrac{32 + 234}{25}$
   $= \dfrac{275}{25}$
   $= 11$

9. Area of left rectangle: $55 \text{ ft} \times 120 \text{ ft} = 6600 \text{ ft}^2$
Area of middle rectangle: $160 \text{ ft} \times 60 \text{ ft} = 9600 \text{ ft}^2$
Area of right rectangle: $260 \text{ ft} \times 60 \text{ ft} = \underline{21{,}600 \text{ ft}^2}$
Total area: $= 31{,}800 \text{ ft}^2$
Area in tsf $= 31{,}800 \text{ ft}^2 \div 1000 = 31.8$ tsf

10. Volume of left box: $10 \text{ cm} \times 1 \text{ cm} \times 1 \text{ cm} = 10 \text{ cm}^3$
Volume of middle box: $10 \text{ cm} \times 1 \text{ cm} \times 1 \text{ cm} = 10 \text{ cm}^2$
Volume of right box: $10 \text{ cm} \times 1 \text{ cm} \times 1 \text{ cm} = \underline{10 \text{ cm}^2}$
Total Volume: $= 30 \text{ cm}^2$

11. $C = \frac{5}{9}(F - 32)$
$C = \frac{5}{9}(50 - 32)$
$= \frac{5}{9}(18)$
$= 10$

12. $P = \frac{Fs}{t}$
$P = \frac{(600)(50)}{10}$
$= \frac{30{,}000}{10}$
$= 3000$

13. $4 + 6 + 0 = 10$ is not divisible by 3, so 28 is not divisible by 3.

14. $54 = 2 \cdot 3 \cdot 3 \cdot 3$

15. $330 = 2 \cdot 3 \cdot 5 \cdot 11$

16. $\frac{36}{56} = \frac{9 \cdot 4}{14 \cdot 4} = \frac{9}{14}$

17. $\frac{180}{216} = \frac{5 \cdot 36}{6 \cdot 36} = \frac{5}{6}$

18. $4\frac{1}{6}$

19. $3\frac{18}{5} = 3 + \frac{18}{5} = 3 + 3\frac{3}{5} = 6\frac{3}{5}$

20. $2\frac{5}{8} = \frac{(2 \times 8) + 5}{8} = \frac{21}{8}$

21. $3\frac{7}{16} = \frac{(3 \times 16) + 7}{16} = \frac{55}{16}$

22. $\frac{16}{8} = 2$

23. $\frac{1}{4} + \frac{5}{12} + \frac{5}{6}$
$= \frac{3}{12} + \frac{5}{12} + \frac{10}{12}$
$= \frac{18}{12} = \frac{3}{2} = 1\frac{1}{2}$

24. $\frac{29}{36} - \frac{7}{30}$
$= \frac{145}{180} - \frac{42}{180}$
$= \frac{103}{180}$

25. $5\frac{3}{16} + 9\frac{5}{12}$
$= 5\frac{9}{48} + 9\frac{20}{48}$
$= 14\frac{29}{48}$

26. $6\frac{3}{8} - 4\frac{7}{12}$
$= 6\frac{9}{24} - 4\frac{14}{24}$
$= 5\frac{33}{24} - 4\frac{14}{24}$
$= 1\frac{19}{24}$

27. $18-6\frac{2}{5}$
$=17\frac{5}{5}-6\frac{2}{5}$
$=11\frac{3}{5}$

28. $16\frac{2}{3}+1\frac{1}{4}-12\frac{11}{12}$
$=16\frac{8}{12}+1\frac{3}{12}-12\frac{11}{12}$
$=17\frac{11}{12}-12\frac{11}{12}$
$=5$

29. $\frac{1}{4}$

30. $3\frac{6}{7}\times 4\frac{2}{3}$
$=\frac{27}{7}\times\frac{14}{3}$
$=18$

31. $\frac{3}{8}\div 6$
$=\frac{3}{8}\times\frac{1}{6}$
$=\frac{1}{16}$

32. $\frac{2}{3}\div 1\frac{7}{9}$
$=\frac{2}{3}\div\frac{16}{9}$
$=\frac{2}{3}\times\frac{9}{16}$
$=\frac{3}{8}$

33. $1\frac{4}{5}\div 1\frac{9}{16}\times 11\frac{2}{3}$
$=\frac{9}{5}\div\frac{25}{16}\times\frac{35}{3}$
$=\frac{9}{5}\times\frac{16}{25}\times\frac{35}{3}$
$=\frac{144}{125}\times\frac{35}{3}$
$=\frac{336}{25}=13\frac{11}{25}$

34. $A=12\frac{5}{16}\text{ in.}-4\frac{3}{8}\text{ in.}-4\frac{9}{16}\text{ in.}$
$=12\frac{5}{16}\text{ in.}-4\frac{6}{16}\text{ in.}-4\frac{9}{16}\text{ in.}$
$=12\frac{5}{16}\text{ in.}-8\frac{15}{16}\text{ in.}$
$=11\frac{21}{16}\text{ in.}-8\frac{15}{16}\text{ in.}$
$=3\frac{6}{16}\text{ in.}=3\frac{3}{8}\text{ in.}$
$B=9\frac{3}{32}\text{ in.}-6\frac{5}{32}\text{ in.}+2\frac{1}{2}\text{ in.}$
$=9\frac{3}{32}\text{ in.}+2\frac{16}{32}\text{ in.}-6\frac{5}{32}\text{ in.}$
$=11\frac{19}{32}\text{ in.}-6\frac{5}{32}\text{ in.}$
$=5\frac{14}{32}\text{ in.}=5\frac{7}{16}\text{ in.}$

35. $6\text{ lb }\ 9\text{ oz}=\left(6\text{ lb}\times\frac{16\text{ oz}}{1\text{ lb}}\right)+9\text{ oz}=105\text{ oz}$

36. $168\text{ ft}\times\frac{12\text{ in.}}{1\text{ ft}}=2016\text{ in.}$

37. $72\text{ ft}\times\frac{1\text{ yd}}{3\text{ ft}}=24\text{ yd}$

38. $36\text{ mi}\times\frac{1760\text{ yd}}{3\text{ mi}}=63{,}360\text{ yd}$

39. 0.5625

40. $0.41\overline{6}$

41. $\frac{45}{100}=\frac{9}{20}$

42. $19\frac{625}{1000}=19\frac{5}{8}$

43. 168.278

44. 17.25

45. 68.665

46. 33.72

47. 3206.5

48. 1.9133

49. 3.18

50. 20.6

51. a. 200

    b. 248.2

    c. 250

52. a. 5.6

    b. 5.65

    c. 5.6491

53. $15\% = \dfrac{15}{100} = 0.15$

54. $8\dfrac{1}{4}\% = 8.25\% = 0.0825$

55. 6.5%

56. 120%

57. $P = BR$

$P = (\$12,000)(0.0875)$

$= \$1050$

58.

Fraction	Decimal	Percent
$\frac{1}{4}$	0.25	25%
$\frac{3}{8}$	0.375	$37\frac{1}{2}\%$
$\frac{5}{6}$	$0.83\frac{1}{3}$	$83\frac{1}{3}\%$
$8\frac{3}{4}$	8.75	875%
$2\frac{2}{5}$	2.4	240%
$\frac{3}{2000}$	0.0015	0.15%

59. $R = \dfrac{P}{B}$

$R = \dfrac{\$32,000}{\$84,000}$

$= 38.1\%$

60. $R = \dfrac{P}{B}$

$R = \dfrac{\frac{11}{64}}{\frac{13}{32}} = \dfrac{11}{64} \times \dfrac{32}{13}$

$= 42.3\%$

61. $60 \text{ tons} \times 0.80 = 48 \text{ tons}$

62. Area of ceiling: $16 \text{ ft} \times 20 \text{ ft} = 320 \text{ ft}^2$

Area of left/right walls: $2 \times 9 \text{ ft} \times 16 \text{ ft} = 288 \text{ ft}^2$

Area of front/back walls: $2 \times 9 \text{ ft} \times 20 \text{ ft} = 360 \text{ ft}^2$

Total area: $= 968 \text{ ft}^2$

$968 \text{ ft}^2 \div 400 \text{ ft}^2 = 2.42;$ Three gallons of paint are needed.

The total cost will be $3 \times (\$16.99 + 0.0775 \times \$16.99) = \$54.92$.

63. $\dfrac{7}{8} \text{ in.} - \dfrac{9}{16} \text{ in.} = \dfrac{14}{16} \text{ in.} - \dfrac{9}{16} \text{ in.} = \dfrac{5}{16} \text{ in.}$

64. Height $= 20 \text{ in.} + 2 \times 5 \text{ in.} = 30 \text{ in.}$

Length $= 4 \times 10 \text{ in.} + 1 \text{ in.} = 41 \text{ in.}$

The sheet of cardboard would have to be 30 in. $\times$ 41 in.

65. 4020

66. 139

67. $A = P\left(1 + \dfrac{r}{n}\right)^{nt}$

$A = \$12,500\left(1 + \dfrac{0.045}{2}\right)^{(2)(5)}$

$= \$12,500(1.0225)^{10}$

$= \$15,615.04$

68. Truck: $\left(\left[\$26,500-\$2500\right]\right)\times 0.80=\$19,200$

Tax: $\$19,200\times 0.0725=\$1392$

$P=\$19,200+\$1392=\$20,592$

$i=0.0725/12$

$n=5\times 12=60$

$$A=P\left(\frac{i(1+i)^n}{(1+i)^n-1}\right)$$

$$A=\$20,592\left(\frac{\left(\frac{0.0725}{12}\right)\left(1+\frac{0.0725}{12}\right)^{60}}{\left(1+\frac{0.0725}{12}\right)^{60}-1}\right)$$

$=\$402.91$

Chapter 1 Test

1. 5729
2. 3516
3. 2,584.450
4. 1600
5. $8+2(5\times 6+8)$
   $=8+2(30+8)$
   $=8+2(38)$
   $=8+76=84$
6. $15-9\div 3+3\times 4$
   $=15-3+12=24$
7. Area of upper rectangle: $10\text{ m}\times 40\text{ m}=400\text{ m}^2$
   Area of middle rectangle: $10\text{ m}\times 15\text{ m}=150\text{ m}^2$
   Area of lower rectangle: $10\text{ m}\times 20\text{ m}=\underline{200\text{ m}^2}$
   Total area: $=750\text{ m}^2$
8. Volume of outer box: $10\text{ in.}\times 12\text{ in.}\times 20\text{ in.}=2400\text{ in}^3$
   Volume of missing corner: $3\text{ in.}\times 4\text{ in.}\times 20\text{ in.}=\underline{240\text{ in}^3}$
   Total Volume: $=2160\text{ in}^3$
9. $\frac{120\text{ V}}{40\,\Omega}=3\text{ A}$
10. $P=2l+2w$
    $P=2(20)+2(15)$
    $=40+30$
    $=70$
11. $t=\frac{d}{r}$
    $t=\frac{1050}{21}$
    $=50$
12. $P=2a+b$
    $P=2(36)+15$
    $=72+15$
    $=87$
13. $90=2\cdot 3\cdot 3\cdot 5$
14. $220=2\cdot 2\cdot 5\cdot 11$
15. $\frac{30}{64}=\frac{15\cdot 2}{32\cdot 2}=\frac{15}{32}$

16. $\frac{28}{42} = \frac{2 \cdot 14}{3 \cdot 14} = \frac{2}{3}$

17. $\frac{23}{6} = 3 \text{ r } 5 = 3\frac{5}{6}$

18. $3\frac{1}{4} = \frac{3 \times 4 + 1}{4} = \frac{13}{4}$

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

20. $\frac{5}{16} - \frac{5}{32} = \frac{10}{32} - \frac{5}{32} = \frac{5}{32}$

21. $3\frac{1}{8} = 3\frac{1}{8}$
$2\frac{1}{2} = 2\frac{4}{8}$
$\underline{4\frac{3}{4} = 4\frac{6}{8}}$
$9\frac{11}{8} = 10\frac{3}{8}$

22. $10\frac{1}{8} - 3\frac{5}{16}$
$= 10\frac{2}{16} - 3\frac{5}{16}$
$= 9\frac{18}{16} - 3\frac{5}{16}$
$= 6\frac{13}{16}$

23. $3\frac{5}{8} + 2\frac{3}{16} - 1\frac{1}{4}$
$= 3\frac{10}{16} + 2\frac{3}{16} - 1\frac{4}{16}$
$= 5\frac{13}{16} - 1\frac{4}{16}$
$= 4\frac{9}{16}$

24. $\frac{3}{8} \times \frac{16}{27} = \frac{3}{8} \times \frac{8 \cdot 2}{9 \cdot 3} = \frac{2}{9}$

25. $\frac{3}{8} \div 3\frac{5}{16} = \frac{3}{8} \div \frac{53}{16}$
$= \frac{3}{8} \times \frac{16}{53}$
$= \frac{6}{53}$

26. $\frac{3}{40}$

27. $3\frac{5}{8} + 1\frac{3}{4} \times 6\frac{1}{5} = \frac{29}{8} + \frac{7}{4} \times \frac{31}{5}$
$= \frac{29}{8} + \frac{217}{20}$
$= \frac{145}{40} + \frac{434}{40}$
$= \frac{579}{40} = 14\frac{19}{40}$

28. $P = 2l + 2w$
$P = 2\left(4\frac{3}{4}\right) + 2\left(2\frac{1}{2}\right)$
$= 2\left(\frac{19}{4}\right) + 2\left(\frac{5}{2}\right)$
$= \frac{19}{2} + \frac{10}{2}$
$= \frac{29}{2} = 14\frac{1}{2}$

29. $3\frac{5}{8} \text{ A} + 2\frac{3}{4} \text{ A} + 4\frac{5}{16} \text{ A}$
$= 3\frac{10}{16} \text{ A} + 2\frac{12}{16} \text{ A} + 4\frac{5}{16} \text{ A}$
$= 9\frac{27}{16} \text{ A} = 10\frac{11}{16} \text{ A}$

30. $120 \text{ ft} \times \frac{1 \text{ yd}}{3 \text{ ft}} = 40 \text{ yd}$

31. $3 \text{ lb } 5 \text{ oz} = \left(3 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}}\right) + 5 \text{ oz} = 53 \text{ oz}$

32. $\frac{5}{8} = 0.625$

33. $2.12 = 2\frac{12}{100} = 2\frac{3}{25}$

34. 65.024

35. 397.19

36. a. 27.3

b. 27.28

37. 8.0784

38. 0.05

39. $B = \dfrac{P}{R}$

$B = \dfrac{59.45}{0.41}$

$= 145$

40. $R = \dfrac{P}{B}$

$R = \dfrac{88}{284}$

$= 31.0\%$

41. $P = BR$

$P = (\$612)(0.067)$

$= \$41$

Her new salary is $\$612 + \$41 = \$653$.

42. 0.0552

43. 6.73

44. $A = P\left(1 + \dfrac{r}{n}\right)^{nt}$

$A = \$4000\left(1 + \dfrac{0.045}{12}\right)^{(12)(3)}$

$= \$4000(1.00375)^{36}$

$= \$4576.99$