

## Section 6.2 Percent Equations and Applications

### Section 6.2 Practice Exercises

1.  $0.059 = 0.059 \times 100\% = 5.9\%$

3.  $124\% = 124 \times 0.01 = 1.24$

$$124\% = \frac{124}{100} = \frac{31}{25}$$

5.  $3x = 27$

$$\frac{3x}{3} = \frac{27}{3}$$
$$x = 9$$

7.  $\frac{62}{100} = \frac{x}{47}$

$$100x = 62(47)$$

$$100x = 2914$$

$$\frac{100x}{100} = \frac{2914}{100}$$

$$x = 29.14$$

9.  $\frac{43}{80} = \frac{x}{100}$

$$80x = 43(100)$$

$$80x = 4300$$

$$\frac{80x}{80} = \frac{4300}{80}$$

$$x = 53.75$$

11. Let  $x$  represent the unknown amount.

$$x = (35\%)(700)$$

$$x = (0.35)(700)$$

$$x = 245$$

13. Let  $x$  represent the unknown amount.

$$x = (0.55\%)(900)$$

$$x = (0.0055)(900)$$

$$x = 4.95$$

15. Let  $x$  represent the unknown amount.

$$x = (133\%)(600)$$

$$x = (1.33)(600)$$

$$x = 798$$

17. 50% equals one-half of the number. So multiply the number by  $\frac{1}{2}$ .

19.  $2 \cdot 14 = 28$

21.  $\frac{1}{2} \cdot 40 = 20$

23. Let  $x$  represent the amount of active ingredient.

$$x = (6\%)(64)$$

$$x = (0.06)(64)$$

$$x = 3.84$$

There are 3.84 oz of sodium hypochlorite in household bleach.

25. Let  $x$  represent the number of completed passes.

$$x = (60\%)(8358)$$

$$x = (0.6)(8358) \approx 5015$$

He completed approximately 5015 passes.

27. Let  $x$  represent the base.

$$18 = (0.40)x$$

$$\frac{18}{0.4} = \frac{0.4x}{0.4}$$
$$45 = x$$

29. Let  $x$  represent the base.

$$(0.92)x = 41.4$$

$$\frac{0.92x}{0.92} = \frac{41.4}{0.92}$$
$$x = 45$$

31. Let  $x$  represent the base.

$$3.09 = (1.03)x$$

$$\frac{3.09}{1.03} = \frac{1.03x}{1.03}$$
$$3 = x$$

33. Let  $x$  represent the number tested.

$$47 = (0.04)x$$

$$\frac{47}{0.04} = \frac{0.04x}{0.04}$$
$$1175 = x$$

There were 1175 subjects tested.

35. Let  $x$  represent the total population.

$$80 = (0.26)x$$

$$\frac{80}{0.26} = \frac{0.26x}{0.26}$$
$$308 \approx x$$

At that time, the population was about 308 million.

37. Let  $x$  represent the percent.

$$x \cdot 480 = 120$$

$$\frac{480x}{480} = \frac{120}{480}$$

$$x = 0.25$$

$$x = 0.25 \times 100\%$$

$$x = 25\%$$

39. Let  $x$  represent the percent.

$$666 = x \cdot 740$$

$$\frac{666}{740} = \frac{740x}{740}$$

$$0.9 = x$$

$$x = 0.9 \times 100\%$$

$$x = 90\%$$

41. Let  $x$  represent the percent.

$$x \cdot 300 = 400$$

$$\frac{300x}{300} = \frac{400}{300}$$

$$x = 1.333$$

$$x = 1.333 \times 100\%$$

$$x = 133.3\%$$

43. Let  $x$  represent the percent.

$$x \cdot 8079 = 406$$

$$\frac{8079x}{8079} = \frac{406}{8079}$$

$$x \approx 0.0502$$

$$x = 0.0502 \times 100\%$$

$$x = 5\%$$

5% of American Peace Corps volunteers were over 50 years old.

$$45.(a) 4 + 2 + 14 + 10 + 16 + 18 + 10 + 6 = 80$$

There are 80 total employees.

(b) Let  $x$  represent the percent.

$$x \cdot 80 = 10$$

$$\frac{80x}{80} = \frac{10}{80}$$

$$x = 0.125$$

$$x = 0.125 \times 100\%$$

$$x = 12.5\%$$

12.5% missed 3 days of work.

$$(c) 2 + 14 + 10 + 16 + 18 = 60$$

Let  $x$  represent the percent.

$$x \cdot 80 = 60$$

$$\frac{80x}{80} = \frac{60}{80}$$

$$x = 0.75$$

$$x = 0.75 \times 100\%$$

$$x = 75\%$$

75% missed 1 to 5 days of work.

$$47. x = (45\%)(62)$$

$$x = 0.45(62)$$

$$x = 27.9$$

$$49. x(140) = 28$$

$$140x = 28$$

$$\frac{140x}{140} = \frac{28}{140}$$

$$x = 0.20$$

$$x = 0.20(100\%) = 20\%$$

$$51. 23\%(x) = 34.5$$

$$0.23x = 34.5$$

$$\frac{0.23x}{0.23} = \frac{34.5}{0.23}$$

$$x = 150$$

$$53. x = (18.5\%)(3000)$$

$$x = 0.185(3000)$$

$$x = 555$$

$$55. 350\%(x) = 2100$$

$$3.50x = 2100$$

$$\frac{3.5x}{3.5} = \frac{2100}{3.5}$$

$$x = 600$$

$$57. x(600) = 1.2$$

$$600x = 1.2$$

$$\frac{600x}{600} = \frac{1.2}{600}$$

$$x = 0.002$$

$$x = 0.002(100\%) = 0.2\%$$

59. Let  $x$  represent the total number of hospital stays.

$$6.3 = (0.18)x$$

$$\frac{6.3}{0.18} = \frac{0.18x}{0.18}$$

$$35 = x$$

There were 35 million total hospital stays that year.

61. Let  $x$  represent the percent.

$$x \cdot 87 = 11$$

$$\frac{87x}{87} = \frac{11}{87}$$

$$x \approx 0.126$$

$$0.126 \times 100\% = 12.6\%$$

Approximately 12.6% of Florida's panthers live in Everglades National Park.

63. Let  $x$  represent the number saving for their children's education.

$$x = (0.52)(800)$$

$$x = 416$$

416 parents would be expected to have started saving for their children's education.

65. Let  $x$  represent the total cost of the TV.

$$1440 = (0.60)x$$

$$\frac{1440}{0.60} = \frac{0.60x}{0.60}$$

$$2400 = x$$

The total cost of the TV is \$2400.

$$67. (a) \$49,000 - \$8800 = \$40,200$$

(b) Let  $n$  represent the 2011 salary.

$$n = 49,000 + 49,000(0.04)$$

$$n = 49,000 + 1960$$

$$n = \$50,960$$

Let  $f$  represent the 2011 cost of food.

$$f = 8800 + 8800(0.62)$$

$$f = 8800 + 545.60$$

$$f = 9345.60$$

$$50,960 - 9346 = \$41,614$$

The amount remaining from his salary after subtracting the cost of food is \$41,614.

**69.** Let  $x$  represent the number in 35–44 age group.

$$x = 0.204(60,000)$$

$$x = 12,240$$

12,240 accidents involved drivers 35–44 years old.

**71.** Let  $x$  represent the total traffic fatalities.

$$9040 = 0.226x$$

$$\frac{9040}{0.226} = \frac{0.226x}{0.226}$$

$$40,000 = x$$

There were 40,000 traffic fatalities.

**73.(a)**  $220 - 20 = 200$  beats per minute

$$\text{(b)}(0.60)(200) = 120$$

$$(0.85)(200) = 170$$

Between 120 and 170 beats per minute

### Problem Recognition Exercises: Percents

**1.**  $0.10(82) = 8.2$

**3.**  $0.20(82) = 16.4$

**5.**  $2.00(82) = 164$

**7.** Greater than, since  $104\% > 100\%$ .

**9.** Greater than, since  $11\% > 10\%$  and  $10\%$  of 90 is 9.

**11.** Let  $x$  represent the base.

$$6 = (0.002)x$$

$$\frac{6}{0.002} = \frac{0.002x}{0.002}$$

$$3000 = x$$

**13.** Let  $x$  represent the number.

$$x = (0.12)(40)$$

$$x = 4.8$$

**15.** Let  $x$  represent the base.

$$\frac{150}{100} = \frac{105}{x}$$

$$150x = (100)(105)$$

$$150x = 10,500$$

$$\frac{150x}{150} = \frac{10,500}{150}$$

$$x = 70$$

**17.** Let  $x$  represent the amount.

$$x = (0.07)(90)$$

$$x = 6.3$$

**19.** Let  $x$  represent the percent.

$$x \cdot 60 = 180$$

$$\frac{60x}{60} = \frac{180}{60}$$

$$x = 3$$

$$x = 3 \times 100\%$$

$$x = 300\%$$

**21.** Let  $x$  represent the base.

$$75 = (0.001)x$$

$$\frac{75}{0.001} = \frac{0.001x}{0.001}$$

$$75,000 = x$$

**23.** Let  $x$  represent the amount.

$$x = (0.50)(50)$$

$$x = 25$$

**25.** Let  $x$  represent the base.

$$50 = (0.50)x$$

$$\frac{50}{0.50} = \frac{0.50x}{0.50}$$

$$100 = x$$

27. Let  $x$  represent the percent.

$$\begin{aligned}x \cdot 250 &= 2 \\ \frac{250x}{250} &= \frac{2}{250} \\ x &= 0.008 \\ x &= 0.008 \times 100\% \\ x &= 0.8\%\end{aligned}$$

29. Let  $x$  represent the amount.

$$\begin{aligned}x &= (0.10)(26) \\ x &= 2.6\end{aligned}$$

31. Let  $x$  represent the percent.

$$\begin{aligned}x \cdot 248 &= 186 \\ \frac{248x}{248} &= \frac{186}{248} \\ x &= 0.75 \\ x &= 0.75 \times 100\% \\ x &= 75\%\end{aligned}$$

33. Let  $x$  represent the percent.

$$\begin{aligned}x \cdot 186 &= 248 \\ \frac{186x}{186} &= \frac{248}{186} \\ x &= 1.33\bar{3} \\ x &= 1.33\bar{3} \times 100\% \\ x &= 133.\bar{3}\% \text{ or } 133\frac{1}{3}\%\end{aligned}$$