1. a. 

b. 25% of the bar is shaded and this is one-quarter of 100%. Therefore, 8 is one-quarter of the number. The number is 4 times 8 or 32.

c. \[ \text{part} = \frac{\text{percent}}{\text{whole}} \]
\[ 8 = \frac{25}{100} \times x \]
\[ \frac{8}{25} = x \]
\[ 32 = x \]
We may also solve this problem with a proportion. Use the bar diagram to set up a proportion with a ratio for the part to the whole and a ratio for the percent to 100.
\[ \frac{8}{100} = \frac{25}{x} \]
\[ 800 = 25x \]
Solve for \( x \)
\[ 800 \div 25 = x \]
\[ 32 = x \]
8 is 25% of 32.

3. 

We are looking for the percent.
\[ \text{percent} = \frac{\text{part}}{\text{whole}} \]
\[ x = \frac{130}{270} \]
\[ x = .481 = 48.1\% \]
Or using a proportion, we have
\[ \frac{130}{270} = \frac{x}{100} \]
Solving the proportion using the cross multiplication property, we get \( x = 48.1\% \).
130 is approximately 48.1% of 270.

5. We are looking for the percent.
\[ \text{percent} = \frac{\text{part}}{\text{whole}} \]
\[ x = \frac{114253}{210007} \]
\[ x = .544 = 54.4\% \]
Or using a proportion, we have
\[ \frac{114253}{210007} = \frac{x}{100} \]
\[ x = 54.4\% \]
Nancy Johnson received approximately 54.4% of the vote.

7. Find the part of the solution that is sodium chloride (solute).
\[ \text{part} = \frac{\text{percent}}{\text{whole}} \]
\[ \text{solute} = \frac{\text{percent}}{\text{solution}} \]
\[ x = \frac{.09 \times 250}{32} \]
\[ x = 22.5 \]
We need 22.5 g of sodium chloride (solute).
The remainder of the 250 g of solution is water.
\[ 250 - 22.5 = 227.5 \text{ g} \]
We need to mix 227.5 g of water with 22.5 g of sodium chloride to produce 250 g of solution.

9. The total price is 106% of the original price.
\[ \text{total price} = 1.06 \times 6500 \]
\[ x = 6890 \]
Or we can set up a proportion keeping in mind that the original price represents 100%.
\[ \frac{x}{6500} = \frac{106}{100} \]
Solving for \( x \) with the cross multiplication property, we get \( x = 6890 \).
The total price of the car is $6890.
11. The discount is 40% of the original price. Thus, the sale price is 60% of the original price.

\[
\text{percent} = \frac{\text{sale price}}{\text{original price}} \times 100
\]

\[
0.60 = \frac{x}{29.95}
\]

\[
x = 0.60 \times 29.95 = 17.97
\]

Another way to find the sale price is to find the amount of the discount and subtract it from the original price.

\[
\text{discount} = 0.40 \times 29.95 = 11.98
\]

\[
\text{sale price} = \text{original price} - \text{discount}
\]

\[
\text{sale price} = 29.95 - 11.98 = 17.97
\]

13. a.

\[
\begin{array}{|c|c|c|}
\hline
\text{Year} & \text{Population} & \text{Increase} \\
\hline
1990 & 5,130,032 & 0 \\
2000 & 5,365,228 & 2,255,196 \\
\hline
\end{array}
\]

\[
\text{percent} = \frac{\text{new population}}{\text{original population}} \times 100
\]

\[
\text{percent} = \frac{5,365,228}{5,130,032} \times 100 = 104.01\%
\]

The 2000 population is about 140% of the 1990 population. Thus Arizona's population increased by about 40%.

15. a.

We are looking for the part of the solution that is oil.

\[
\text{part} = \text{percent} \times \text{whole} \times \text{solution} = \text{percent} \times \text{solution}
\]

\[
x = 0.03 \times (x + 4)
\]

\[
x = 0.03x + 0.12
\]

\[
x = \frac{12}{0.03} = 400
\]

\[
x \approx 124 \text{ gallon}
\]

We need 124 gallon of oil.

b. 124 gallon

\[
= \frac{124 \text{ gallon}}{128 \text{ ounces}} = 15.8 \text{ ounces}
\]

We need about 15.8 ounces of oil.

Skills and Review 5.2

17. a. Any proportion that has the same cross product is okay. Two of several proportions:

\[
\frac{4}{3} = \frac{x}{10} \quad \text{or} \quad \frac{x}{4} = \frac{10}{3}
\]

b. 3x = 4 \times 10

\[
x = \frac{40}{3} = 13.33
\]

19. \( Y_1 = \left( \frac{1}{2} \right) X + 3/2, Y_2 = 4/3 X - 2 \)

Windows may vary: ZOOM Decimal. Press 2nd CALC, INTERSECT. Solution = \((1.91, 0.55)\)

21. The equation is in slope-intercept form, \( y = mx + b \). Therefore, the slope is the coefficient of \( x \): \( m = 3 \).

23.

<table>
<thead>
<tr>
<th>Days Rented</th>
<th>Charge ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3+1*1=4</td>
</tr>
<tr>
<td>2</td>
<td>3+1*2=5</td>
</tr>
<tr>
<td>4</td>
<td>3+1*4=7</td>
</tr>
</tbody>
</table>

25. \( 5 + 2(6 - 4)^3 \)

\( = 5 + 2(2)^3 \) Subtract 4 from 6 inside parentheses

\( = 5 + 2 \times 8 \) Cube 2

\( = 5 + 16 \) Multiply 2 by 8

\( = 21 \)