

6.5 Solving Percent Problems

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Sloths may seem lazy, but their extremely slow movement helps to make them almost invisible to predators. Sloths sleep an average of 16.5 hours a day. To find out what percent of a 24-hour day 16.5 hours is, you can use a proportion or an equation.

Proportion Method

$$\begin{array}{l} \text{Part} \rightarrow \frac{n}{100} = \frac{16.5}{24} \leftarrow \text{Part} \\ \text{Whole} \rightarrow \frac{100}{24} = \frac{16.5}{24} \leftarrow \text{Whole} \end{array}$$

$$n \cdot 24 = 100 \cdot 16.5$$

$$24n = 1,650$$

$$n = 68.75$$

Sloths spend about 69% of the day sleeping!

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Equation Method

of = x
is = =

What percent of 24 is 16.5?

$$\begin{array}{l} \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\ n \cdot 24 = 16.5 \\ \frac{24n}{24} = \frac{16.5}{24} \end{array}$$

$$\begin{array}{l} n = 0.6875 \\ n = 68.75\% \end{array}$$

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Solve.

What percent of 40 is 25?

$$\begin{array}{l} \downarrow \\ n \cdot 40 = 25 \\ \frac{25}{40} = \frac{x}{100} \\ \frac{2500}{40} = \frac{40n}{40} \\ 62.5 = 40n \\ n = 0.625 \\ 62.5\% \end{array}$$

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Proportion Method

$$\begin{array}{l} \text{Part} \rightarrow \frac{n}{100} = \frac{16.5}{24} \leftarrow \text{Part} \\ \text{Whole} \rightarrow \frac{100}{24} = \frac{16.5}{24} \leftarrow \text{Whole} \end{array}$$

Solve.

15 is 25% of what number?

$$\begin{array}{l} 15 = .25 \cdot n \\ 15 = .25n \\ \frac{15}{.25} = \frac{.25n}{.25} \\ n = 60 \end{array}$$

Equation Method

What percent of 24 is 16.5?

$$\begin{array}{l} \frac{15}{x} = \frac{25}{100} \\ \frac{1500}{25} = \frac{25x}{25} \\ x = 60 \end{array}$$

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Solve.

What percent of 50 is 10?

$$\begin{array}{l} \downarrow \quad \downarrow \quad \downarrow \\ n \cdot 50 = 10 \\ \frac{50n}{50} = \frac{10}{50} \\ n = 0.20 \\ n = 20\% \end{array}$$

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Solve.

8 is 40% of what number?

$$\downarrow \downarrow$$

$$8 = 0.4 \cdot n$$

$$\frac{8}{0.4} = \frac{0.4n}{0.4}$$

$$n = 20$$

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Solve.

35 is 28% of what number?

$$\frac{35}{.28} = \frac{.28n}{.28} \quad n = 125$$

Solve.

36 is 24% of what number?

$$\frac{36}{.24} = \frac{.24n}{.24} \quad n = 150$$

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Solve.

What percent of 9 is 18?

$$n \cdot 9 = 18$$

$$\frac{9n}{9} = \frac{18}{9} \quad n = 200\%$$

Solve.

What percent of 6 is 36?

$$n \cdot 6 = 36$$

$$\frac{6n}{6} = \frac{36}{6} \quad n = 600\%$$

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A portable DVD player costs \$225 before tax at an appliance warehouse. What is the sales tax rate if the tax is \$18?

Restate the question: What percent of \$225 is \$18?

$$n \cdot 225 = 18$$

$$\frac{225n}{225} = \frac{18}{225}$$

$$n = 0.08$$

$$8\%$$

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A new flat screen TV costs \$800 before tax at an appliance warehouse. What is the sales tax rate if the tax is \$56?

Restate the question: What percent of \$800 is \$56?

$$n \cdot 800 = 56$$

$$\frac{800n}{800} = \frac{56}{800}$$

$$n = 7\%$$

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Lesson Quiz

Solve.

- 21 is 42% of what number? 50
 $21 = .42 \cdot n$
- What percent of 292 is 73? 25%
 $n \cdot 292 = 73$
- 112% of what number is 84? 75
 $1.12 \cdot n = 84$
- What percent of 1,340 is 13.4? 1%
 $n \cdot 1340 = 13.4$
- An ad features a bicycle on sale for \$139. If the total cost of the bike is \$147.34, what is the sales tax rate? $n \cdot 139 = 8.34$

$$6\%$$

May 16-9:18 AM