

9.4 (Page 334) Using the Percent Proportion

The proportion below shown is called the PERCENT PROPORTION. It can be used to solve problems involving percent.

$$\frac{\text{Percentage}}{\text{Base}} = \text{Rate} \quad \text{or} \quad \frac{P}{B} = \frac{r}{100}$$

The percentage (P) is a number that is compared to another number called the base (B). The rate is a percent that always compares r to 100.

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Example: Express each fraction as a percent.

$$\frac{31}{100}$$

31%

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Using the Percent Proportion

Example: Express each fraction as a percent.

$$\frac{1}{25} \times 4 = \frac{4}{100}$$

4%

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Using the Percent Proportion

Example: Express each fraction as a percent.

$$\frac{3}{5} \times 20 = \frac{60}{100}$$

60%

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Using the Percent Proportion

Example: Express each fraction as a percent.

$$\frac{7}{20} \times \frac{5}{5} = \frac{35}{100}$$

$$35\%$$

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Using the Percent Proportion

Example: Express each fraction as a percent.

$$\begin{array}{r} 37.5 \\ 8 \overline{) 300.0} \\ \underline{-240} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

~~$$\frac{3}{8} = \frac{r}{100}$$~~

$$\frac{300}{8} = \frac{8r}{8}$$

$$r = 37.5\%$$

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When using the percent proportion, there are different ways of asking for different part of the proportion.

Proportion

$$\frac{\cancel{x}}{4} = \frac{75}{100}$$

$$\frac{3}{4} = \frac{\cancel{x}}{100}$$

$$\frac{3}{\cancel{x}} = \frac{75}{100}$$

Word Form

What number is 75% of 4?

3 is what percent of 4?

3 is 75% of what number?

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

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Example: Identify the percentage, base, and rate.

Then write a proportion and solve.

Find 7.5% of 405.

$$\frac{d}{405} = \frac{7.5}{100}$$

$$\frac{100d}{100} = \frac{3037.5}{100}$$

$$\begin{array}{r} 405 \\ \times 7.5 \\ \hline 2025 \\ +28350 \\ \hline 3037.5 \end{array}$$

$$d = 30.375$$

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Using the Percent Proportion

Example: Identify the percentage, base, and rate.

Then write a proportion and solve.

Twenty-eight is 20% of what number?

$$\frac{28}{y} = \frac{20}{100}$$

$$\frac{2800}{20} = \frac{20y}{20}$$

$$y = 140$$

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Example: Identify the percentage, base, and rate.

Then write a proportion and solve.

Sixteen is 40% of what number?

$$\frac{16}{x} = \frac{40}{100}$$

$$\frac{1600}{40} = \frac{40x}{40}$$

$$x = 40$$

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Example: Identify the percentage, base, and rate.

Then write a proportion and solve.

19 is what percent of 76?

$$\frac{19}{76} = \frac{t}{100}$$

$$\frac{1900}{76} = \frac{76t}{76}$$

$$t = 25\%$$

$$\begin{array}{r} 25 \\ 76 \overline{) 1900} \\ \underline{-1520} \\ 380 \\ \underline{-380} \\ 0 \end{array}$$

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Example: Identify the percentage, base, and rate.

Then write a proportion and solve.

37 is what percent of 296?

$$\frac{37}{296} = \frac{w}{100}$$

$$\frac{3700}{296} = \frac{296w}{296}$$

$$w = 12.5\%$$

$$\begin{array}{r} 12.5 \\ 296 \overline{) 3700.0} \\ \underline{-2960} \\ 740 \\ \underline{-592} \\ 1480 \\ \underline{-1480} \\ 0 \end{array}$$