

## Chapter 2 Extra Lesson #1

## Percent Problems

percent means "per hundred"

Example 1

Change  $\frac{17}{20}$  to a percent.

$$\frac{17}{20} = \frac{p}{100}$$

$$\begin{aligned} 20 \cdot p &= 17 \cdot 100 \\ \frac{20p}{20} &= \frac{1700}{20} \\ p &= 85\% \end{aligned}$$

use calc

$$.85 \times 100 = 85\%$$

$$\begin{array}{r} 20 \overline{) 17.00} \\ \underline{-160} \phantom{0} \\ 100 \\ \underline{-100} \\ 0 \end{array}$$

## PERCENT PROPORTION

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

or

$$\frac{\text{part}}{\text{whole}} = \frac{p}{100}$$

Example 2

Fifty is what percent of 400?

Method 1 (Proportion)

$p = ?$  is = 50 of = 400

$$\frac{50}{400} \swarrow \nearrow \frac{p}{100}$$

$$400 \cdot p = 50 \cdot 100$$

$$\frac{400p}{400} = \frac{5000}{400}$$

$$p = 12.5\%$$

Method 2 (Equation)

$$\frac{50}{400} = \frac{p \cdot 400}{400}$$

$$.125 = p \quad \leftarrow \text{decimal}$$

$$\times 100$$

$$12.5\% = p$$

↓  
percent

Example 3

What number is 36% of 150?

$$36\% \rightarrow \frac{36}{100} \rightarrow .36$$

change % to dec.

Method 1 (Proportion)

is = X of = 150 p = 36

$$\frac{X}{150} \swarrow \nearrow \frac{36}{100}$$

$$100 \cdot X = 150 \cdot 36$$

$$\frac{100X}{100} = \frac{5400}{100}$$

$$X = 54$$

Method 2 (Equation)

$$X = .36 \cdot 150$$

$$X = 54$$

## Example 4

40% <sup>mult</sup> of what number is 30?

$$40\% = \frac{40}{100} = .40$$

change % to dec.

Method 1 (Proportion)

Method 2 (Equation)

$$is = 30 \quad of = x \quad p = 40$$

$$\frac{30}{x} \leftrightarrow \frac{40}{100}$$

$$40 \cdot x = 30 \cdot 100$$

$$\frac{40x}{40} = \frac{3000}{40}$$

$$x = 75$$

$$.4 \cdot x = \frac{30}{.4}$$

$$x = 75$$

## Example 5

What is 18% of 46?  
Find 18% of 46.

$$18\% = \frac{18}{100} = .18$$

change % to dec.

Method 1 (Proportion)

Method 2 (Equation)

$$is = x \quad of = 46 \quad p = 18$$

$$\frac{x}{46} \leftrightarrow \frac{18}{100}$$

$$100 \cdot x = 46 \cdot 18$$

$$\frac{100x}{100} = \frac{828}{100}$$

$$x = 8.28$$

$$x = .18 \cdot 46$$

$$x = 8.28$$

Example 6

Faith bought a stereo that usually sells for \$220.

She received a 20% discount. How much did she pay for the stereo?

subtract from price

$$20\% = \frac{20}{100} = .2$$

change % to dec.

Method 1 (Proportion)

Method 2 (Equation)

What is 20% of \$220?

is = x of = 220 p = 20

$$\frac{x}{220} = \frac{20}{100}$$

$$100 \cdot x = 220 \cdot 20$$

$$\frac{100x}{100} = \frac{4400}{100}$$

x = \$44 discount

$$\begin{array}{r} \$220 \\ - 44 \\ \hline \boxed{\$176} \end{array}$$

$$x = .2 \cdot 220$$

$$x = 44$$

$$\begin{array}{r} \$220 \\ - 44 \\ \hline \boxed{\$176} \end{array}$$

Example 7

$$\frac{\text{part}}{\text{whole}} = \frac{p}{100}$$

John scored 85% on the last test. He answered 34 questions correctly. How many questions were on the test?

$$85\% = \frac{85}{100} = .85$$

Method 1 (Proportion)

Method 2 (Equation)

part = 34 whole = x p = 85

34 is 85% of what #?

$$\frac{34}{x} = \frac{85}{100}$$

$$\frac{34}{.85} = \frac{.85 \cdot x}{.85}$$

$$85 \cdot x = 34 \cdot 100$$

$$\frac{85x}{85} = \frac{3400}{85}$$

$$\boxed{x = 40 \text{ questions}}$$

$$\boxed{40 \text{ questions} = x}$$