

3.5-3.6 Review: Write & Solve Ratios and Proportions

Ratio	A comparison of two quantities, using division a to b $a:b$ $\frac{a}{b}$
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Example

At a carwash fundraiser, 18-9th grade students & 14-10th grade students worked the first shift

a) Find the ratio of 9th grade students to 10th grade students $\frac{18}{14} = \frac{9}{7}$

b) Find the ratio of 9th grade students to all students $\frac{18}{18+14} = \frac{18}{32} = \frac{9}{16}$

Proportion	An equation that states that two ratios are equivalent.
Cross Products of a Proportion	The product of the numerator of one ratio with the denominator of other ratio. Cross products are equal.

Examples...Solve each:

<p>1.) $\frac{9}{2} = \frac{m}{12}$</p> $12 \cdot 9 = 2m$ $\frac{108}{2} = \frac{2m}{2}$ <p style="text-align: center;">$m = 54$</p>	<p>2.) $\frac{4}{x} = \frac{12}{24}$</p> $96 = 12x$ $x = 8$	<p>3.) $\frac{3}{x} = \frac{9}{x-4}$</p> $3(x-4) = 9x$ $3x-12 = 9x$ $-12 = 6x$ $x = -2$						
<p>4.) A recipe for tomato salsa calls for 30 tomatoes to make 12 pints of salsa. How many tomatoes are needed to make 8 pints of salsa?</p> $\frac{30}{12} = \frac{x}{8}$ $240 = 12x$ $x = 20$ <p style="text-align: right;"><i>20 tomatoes</i></p>								
<p>5.) Georgia is making her own potting soil. For every 4 buckets of peat moss, she mixes 3 buckets of perlite. Suppose she uses 10 buckets of peat moss, how many buckets of perlite should she use?</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">Peat moss</td> <td style="padding: 5px;">4</td> <td style="border-left: 1px solid black; padding: 5px;">10</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">Perlite</td> <td style="padding: 5px;">3</td> <td style="border-left: 1px solid black; padding: 5px;">?x</td> </tr> </table> $\frac{4}{3} = \frac{10}{x}$ $4x = 30$ $x = 7\frac{1}{2} \text{ buckets}$			Peat moss	4	10	Perlite	3	?x
Peat moss	4	10						
Perlite	3	?x						

Name _____

Percent Problems

Recall that a percent means "per 100", so	$27\% = \frac{27}{100}$
We can solve percent problems using a proportion!	$\frac{\text{percent}}{100} = \frac{\text{part}}{\text{whole}}$

Examples – solve each percent problem using a proportion:

1.) What percent of 60 is 9?

$$\frac{x}{100} = \frac{9}{60}$$

$$60x = 900$$

$$x = 15\%$$

2.) What number is 12% of 85?

$$\frac{12}{100} = \frac{x}{85}$$

$$1020 = 100x$$

$$x = 10.2$$

3.) 75 is 62.5% of what number?

$$\frac{62.5}{100} = \frac{75}{x}$$

$$62.5x = 7500$$

$$x = 120$$

4.) What percent of 75 is 27?

$$\frac{x}{100} = \frac{27}{75}$$

$$75x = 2700$$

$$x = 36\%$$

5.) What number is 35% of 80?

$$\frac{35}{100} = \frac{x}{80}$$

$$2800 = 100x$$

$$x = 28$$

6.) 81 is 54% of what number?

$$\frac{54}{100} = \frac{81}{x}$$

$$54x = 8100$$

$$x = 150$$

7.) After dining at J. Liu for homecoming, your bill is \$47.89. If you want leave a 20% tip, how much should you pay, total?

$$\frac{20}{100} = \frac{x}{47.89}$$

$$957.8 = 100x$$

$$x = 9.58$$

47.89
+ 9.58
57.47

8.) You bought a sweater on sale for \$15. It originally cost \$40. What percent of the original price did you pay?

$$\frac{x}{100} = \frac{15}{40}$$

$$40x = 1500$$

$$x = 37.5$$

37.5%

What percent was taken off of the original price?

$$100 - 37.5\% = 62.5\%$$