

Unit 4: Scale Factors & Similarity**4.2A Ratios & Proportions (Review)****Ratio:** a comparison of two or more quantities**Ex.** On a bus there are 5 boys & 7 girls. State each ratio:

a) Boys to girls

b) Girls to boys

c) Girls to total

d) Boys to girls to total

$$5:7 \text{ "5 to 7"} \quad 7:5$$

$$7:12 = \frac{7}{12}$$

$$5:7:12$$

A reduce if possible

$$\text{decimal} = 0.58$$

$$\text{percent} = 58\%$$

Proportion: A statement of two equivalent (equal ratios)

$$\text{Ex. } \frac{3}{4} = \frac{6}{8} \text{ or } 3:4 = 6:8$$

Finding unknown values in proportions – 2 methods**Method 1:** inspect & use pattern**Ex.** Find the missing value:

$$\text{a) } \frac{4}{7} = \frac{16}{x}$$

$\times 4$

$$\boxed{x = 28}$$

$$\text{b) } \frac{x}{4} = \frac{24}{32}$$

$\div 8$

$$\boxed{x = 3}$$

Method 2: cross-multiply**Ex.** Find the missing value:

$$\text{a) } \frac{5}{6} = \frac{x}{18}$$

$$\frac{5 \times 18}{6} = \frac{6x}{6}$$

$$\boxed{15 = x}$$

$$\text{b) } 2:7 = 11:x$$

$$\frac{2}{7} = \frac{11}{x}$$

$$x = \frac{7 \times 11}{2}$$

$$x = 38.5$$

Or "multiply the pair and divide by the spare"

$$\frac{5}{6} = \frac{x}{18}$$

$$\frac{5 \times 18}{6} = 15$$

Using Proportions

Ex. The ratio of the width to height of an old TV screen is 4:3. If the width is 32 cm, what is the height of the screen?

$$\frac{w}{h} = \frac{4}{3} = \frac{32 \text{ cm}}{x}$$

$$x = \frac{32 \times 3}{4}$$

$$x = 24 \text{ cm}$$

Ex. On a map, 1 cm represents 800 m. If the actual distance between two spots is 2000 m, how far apart will they be on the map?

$\frac{\text{map}}{\text{actual}}$

$$\frac{1 \text{ cm}}{800 \text{ m}} = \frac{x}{2000 \text{ m}}$$

$$x = \frac{1 \times 2000}{800}$$

$$x = 2.5 \text{ cm}$$