

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

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

$$\frac{5}{7}$$

* reduce if possible

b) Girls to boys

$$7:5 \quad \frac{7}{5}$$

c) Girls to total

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

decimal: 0.58
%. 58%

d) Boys to girls to total

$$5:7:12$$

Proportion: A statement of two equivalent (equal ratios)

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

Finding unknown values in proportions – 2 methods

Method 1: inspect & use pattern

Ex. Find the missing value:

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

$$x = 28$$

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

$$x = 3$$

Method 2: cross-multiply

Ex. Find the missing value:

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

$$5 \cdot 18 = 6x$$

$$90 = 6x$$

$$x = 15$$

or "multiply the pair + divide by the spare"

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

$$x = \frac{5 \cdot 18}{6} = 15$$

b) $2:7 = 11:x$

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

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

$$x = 38.5$$

Using Proportions

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

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

$\times 8$

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

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?

$$\frac{\text{map}}{\text{actual}} = \frac{1 \text{ cm}}{800 \text{ m}} = \frac{x}{2000 \text{ m}}$$
$$x = \frac{1 \cdot 2000}{800}$$
$$= \boxed{2.5 \text{ cm}}$$