

6.2 Warm-Up:

Solve each proportion.

1. $\frac{3}{8} = \frac{6}{x+1}$ $3(x+1) = 6 \cdot 8$ $x = 15$

2. $\frac{8}{3} = \frac{x+1}{6}$ $3(x+1) = 6 \cdot 8$ $x = 15$

3. $\frac{3}{6} = \frac{8}{x+1}$ $3(x+1) = 6 \cdot 8$ $x = 15$

4. The area of a rectangle is 750 square meters. The ratio of the width to the length is 5 : 6. Find the width and the length.

$$5x \cdot 6x = 750$$

$$30x^2 = 750$$

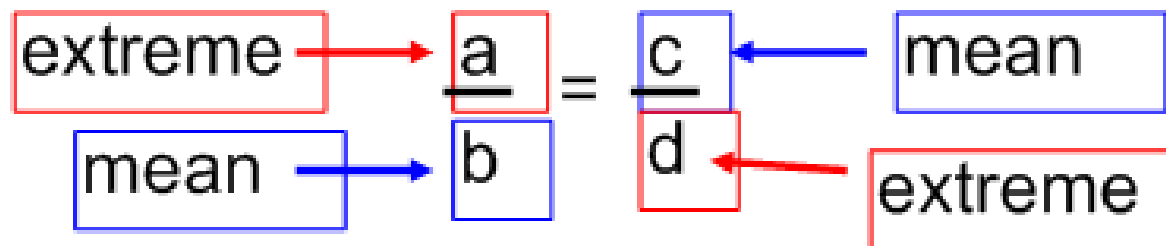
$$x^2 = 25$$

$$x = 5$$

$$\begin{array}{l} w = 25 \text{ m} \\ l = 30 \text{ m} \end{array}$$

6.2 Use Proportions to Solve Geometry Problems

Where we can use these ideas:
Blueprints, maps, and scale models



Properties of proportions:

1. If 2 ratios are =, then their reciprocals are also equal.

$$\frac{1}{2} = \frac{3}{6} \rightarrow \frac{2}{1} = \frac{6}{3}$$

2. If you interchange the means, then you form another true proportion.

$$\frac{1}{2} = \frac{3}{6} \rightarrow \frac{1}{3} = \frac{2}{6}$$

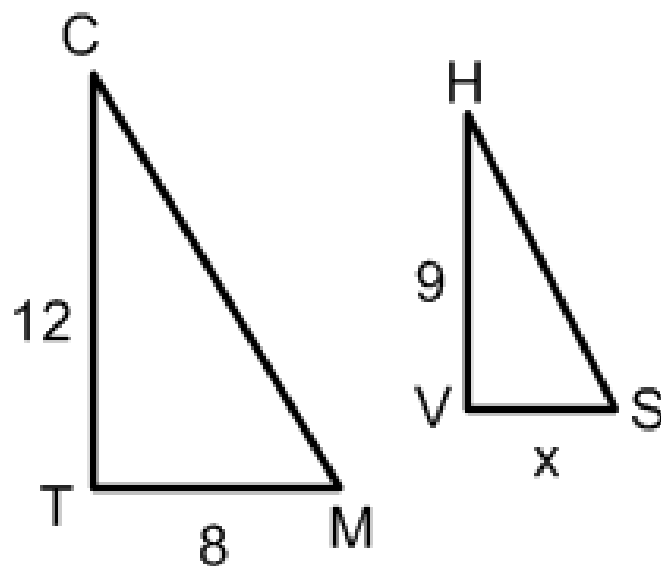
3. If you add the value of each ratio's denominator to its numerator, then you form another true proportion.

$$\frac{1}{2} = \frac{3}{6} \rightarrow \frac{1+2}{2} = \frac{3+6}{6} \rightarrow \frac{3}{2} = \frac{9}{6}$$

Adding
to one
both
sides

In the diagram, $\frac{CT}{TM} = \frac{HV}{VS}$

Write 4 true proportions.



① $\frac{12}{8} = \frac{9}{x}$

② $\frac{8}{12} = \frac{x}{9}$ (reciprocal)

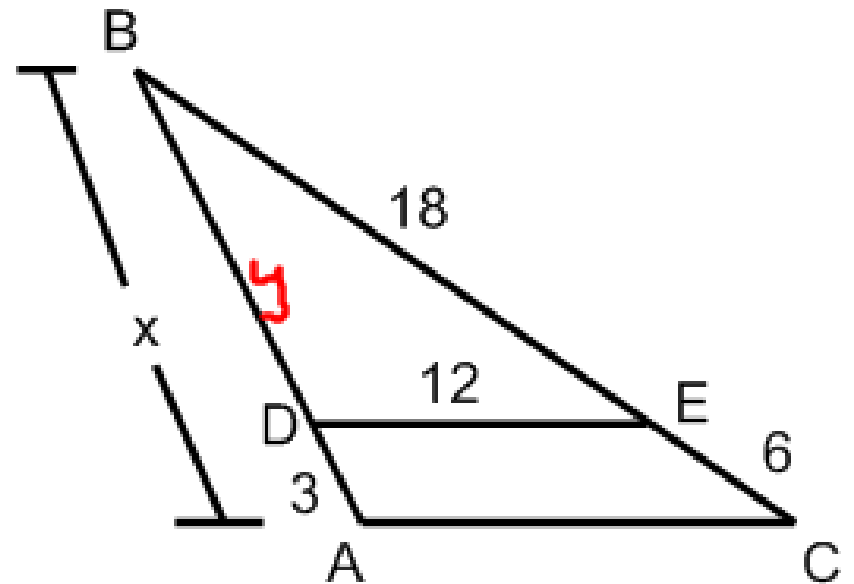
③ $\frac{12}{9} = \frac{8}{x}$ (switch means)

$\frac{20}{8} = \frac{9+x}{x}$

add
denom
to num

In the diagram, $\frac{BD}{DA} = \frac{BE}{EC}$

Find BA and BD.



$$y = \frac{BD}{3} = \frac{18}{6}$$

$$18 \cdot 3 = 6y$$

$$54 = 6y$$

$$9 = y = BD$$

$$BA = 12 = BD + DA$$

Scale drawings and scales...

ratios

What do we know?

Examples?

Blueprint: small version of actual maps, car models, grower things

How could we make scale drawings?

bacteria, atoms

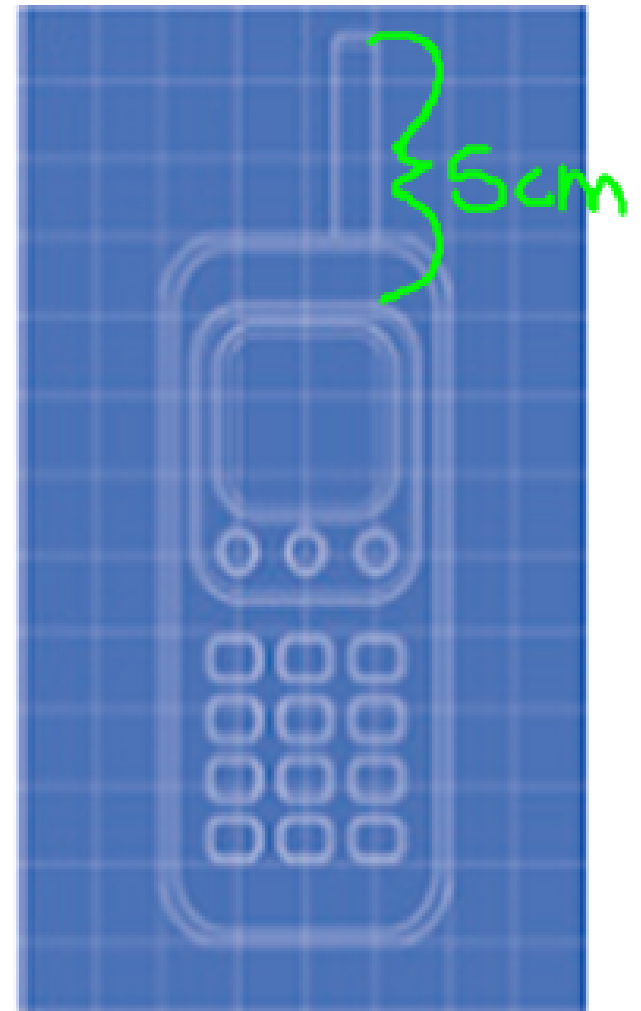
→ scale, measurements (original vs new)

The blueprint shows a scale drawing of a cell phone. The length of the antenna on the blueprint is 5 cm. The actual length of the antenna is 2 cm. What is the scale of the drawing?

$$5 \text{ cm} : 2 \text{ cm}$$

$$2.5 \text{ cm} : 1 \text{ cm}$$

$$2.5 : 1$$



scale: drawing to actual

Finding actual sizes when using scale models.



Toy 4020 dimensions.

Actual dimensions.

$$18 \times 14.5 \times 13''$$

$$\text{Scale: } \frac{1}{8}$$

$$l = \frac{18}{\frac{1}{8}} = 144$$

$$l = 144$$

$$l = 12 \text{ ft}$$

$$w = \frac{14.5}{\frac{1}{8}} = 116$$

$$w = 116$$

$$w = 9.6 \text{ ft}$$

$$w = 9.6 \text{ ft}$$

$$h = \frac{13}{\frac{1}{8}} = 104$$

$$h = 104$$

$$h = 8.6 \text{ ft}$$

$$h = 8.6 \text{ ft}$$

Homework:

p 367

#'s 2-18E, 22-24,
28-29, 38, 40

Quiz next time
over 6.1 & 6.2.