GEOMETRIC PROPORTIONS

- **Geometric proportions** compare two similar polygons. Similar polygons have equal corresponding angles and corresponding sides that are in proportion.

- A **proportion equation** can be used to prove two figures to be similar. If two figures are similar, the proportion equation can be used to find a missing side of one of the figures.

- Scale drawings and scale models also use proportion equations to determine missing information. Scale drawings refer to maps, blueprints and the like. Scale models refer to models of any life size objects whether it is buildings, cars, or planes for example.

How to use geometric proportions:

- When two figures are said to be **similar**, it means that their sides are in p_____ ngles are similar,

PREVIEW

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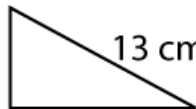$$8 \text{ m} \qquad \qquad 12 \cdot 2 = 24$$
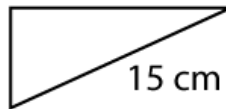
$$12 \text{ m} \qquad \qquad 3$$

- The proportion equation can be used to determine the missing side to be 3 m. To solve similar figures, a proportion can also be used. It is important to make sure the proper sides of the figure match up with the proportion. For example, are the figures shown similar?

$$4 \text{ cm} \qquad 13 \text{ cm} \qquad 5 \text{ cm} \qquad 15 \text{ cm} \qquad \frac{\text{small}}{\text{big}} \quad \frac{5}{15} \neq \frac{4}{13}$$

- By using the proportion equation, you can discover that the triangles are **not similar** because the lengths of their sides are not in proportion.

- **Scale drawings** also use proportion equations. If a map has a scale of 1 inch equal 5 miles, how far would 6.5 inches be?

  Ex. $\dfrac{5 \text{ miles}}{1 \text{ inch}} = \dfrac{x \text{ miles}}{6.5 \text{ inches}}$ $(5)(6.5) = 1x$
  $32.5 = x$, so 6.5 inches equals 32.5 miles

- With proportional equations, it is very important that the correct units are lined up in order to find the correct result. The same proportion equations can be use with scale models. If a model car has the scale of 10 cm = 1 foot and a real car is 15 feet long, how long will the model car be?

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  Ex. $\dfrac{2 \text{ cm}}{1 \text{ foot}} = \dfrac{x \text{ cm}}{15 \text{ feet}}$ $(2)(15) = 1x$
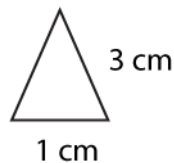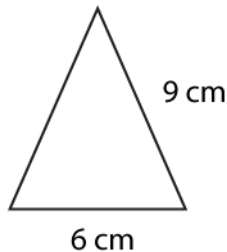 $30 = x$, so model will be 30 cm

Try Thi

1. Two ... issing side?

   2 ft

   x

2. Are the two triangles similar?

   9 cm

   6 cm

   3 cm

   1 cm

3. A map has a scale of 1/2 inch = 10 miles. If two cities are 65 miles apart, how far is that on a ruler?

4. A model truck has a length of 15 cm. If the scale is 1cm = 1.5 feet, what is the length of the real truck?