

# Similar Figures

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9:43 AM

- 2 figures with the same shape, but different sizes

## corresponding angles

↳ 2 angles that occupy the same relative position on similar figures

↳ **congruent** angles means the same or equal shape and size

## corresponding sides

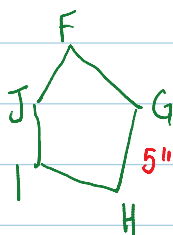
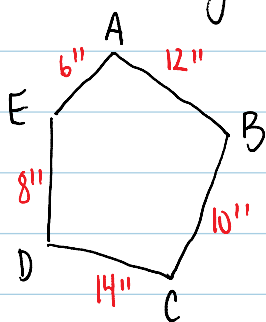
↳ 2 sides that occupy the same relative position in similar figures.

## Determining SIDES in similar figures

- When working with length of sides in similar figures, the ratio of the corresponding sides is always the same.

↳ because the figures are always a reduction or enlargement of each other

Ex. 1 These 2 figures are similar. Find the lengths of the sides of the smaller figure.



Big figure

$$\text{Sides on top} \rightarrow \frac{BC}{GH} = \frac{AB}{FG} \Rightarrow \frac{10}{5} = \frac{12}{FG}$$

smaller figure

STEP 1: set up proportion

STEP 2: cross multiply

→ GH FG  
 Smaller figure  
 Sides on bottom

$$5 \text{ } \overline{FG}$$

$$\frac{FG \cdot 10}{10} = \frac{12 \times 5}{10}$$

$$\boxed{FG = 6''}$$

STEP 2: cross multiply & divide

STEP 3: solve for the side

Another solution....

10'' vs. 5''

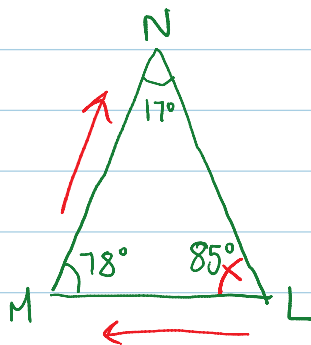
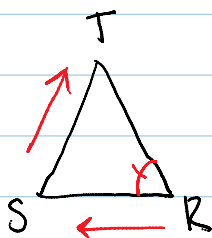
$\frac{10}{5} = 2''$  difference between the 2 figures

....so divide all the sides by 2''

SIDE HI = 7''  
 IJ = 4''  
 JF = 3''

### Determining ANGLES in Similar Figures

$\triangle RST$  is similar to  $\triangle LMN$



$$\angle L = \angle R = 85^\circ$$

\* look for correct alphabetical order to see which angles correspond

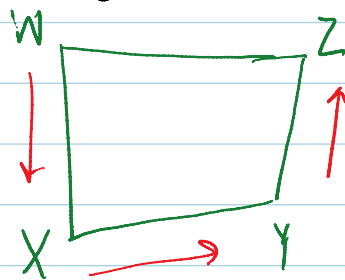
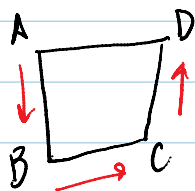
$$\angle M = \angle S = 78^\circ$$

\*re-arrange it if necessary

$$\angle N = \angle T = 17^\circ$$

2 figures are similar if all sides are = and all angles are =

Ex. #1 The quadrilaterals ABCD and WXYZ are similar.  
State the corresponding sides and angles



# look for the alphabetical order of sides and angles

$$\angle A = \angle W$$

$$\angle B = \angle X$$

$$\angle C = \angle Y$$

$$\angle D = \angle Z$$

$$\frac{AB}{WX} = \frac{BC}{XY} = \frac{CD}{YZ} = \frac{DA}{ZW}$$

✓ angles are equal

✓ sides are equal

- The 2 quads are similar because ABCD is similar to WXYZ
- Use the symbol "~" which means "similar to"

$$ABCD \sim WXYZ$$