

# Congruent and Similar Figures

## Objectives:

...to identify polygons that are similar and/or congruent (given either measurements or tic and angle marks)

...to identify corresponding sides and/or angles of similar polygons

...to use proportions to determine if two figures are similar and to do indirect measurements

## Assessment Anchor:



Solve problems using ratios, proportions, percents and/or rates  
Identify congruence and/or similarity in polygons

## NOTES

**Congruent Figures** – figures that have the same shape and the same size.

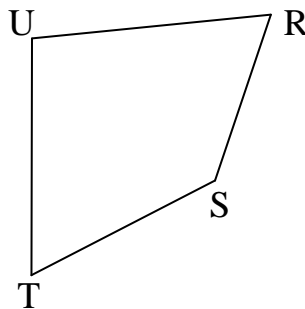
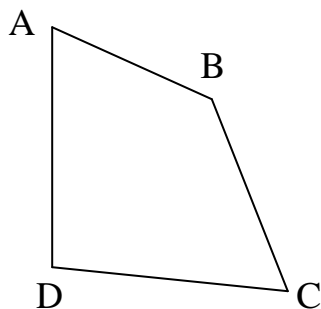
Symbol for congruence ----->  $\cong$

**Similar Figures** – figures that have the same shape, but not necessarily the same size.

Symbol for similarity ----->  $\sim$

**Congruent figures** have corresponding angles and sides that are also congruent.

Given:  $ABCD \cong RSTU$



$$\angle A \cong \angle R$$

$$\angle C \cong \angle T$$

$$\angle D \cong \angle U$$

$$\overline{AB} \cong \overline{RS}$$

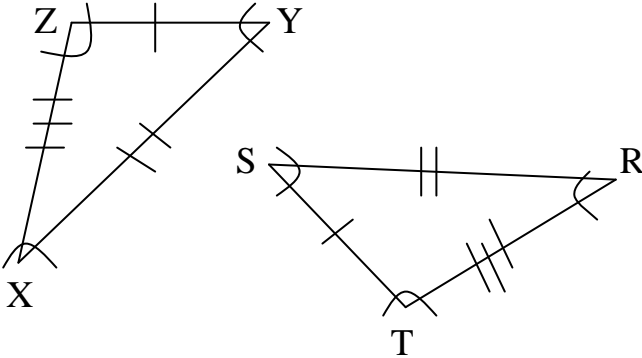
$$\overline{DA} \cong \overline{UR}$$

$$\overline{ST} \cong \overline{BC}$$

# Congruent and Similar Figures

\*\*\*TIC MARKS and ANGLE MARKS can show congruence.

Given:



$$\triangle XYZ \cong \underline{\hspace{2cm}}$$

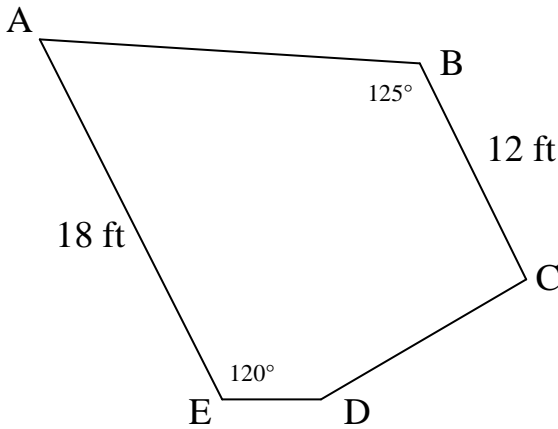
$$\angle Z \cong \underline{\hspace{2cm}}$$

$$\angle R \cong \underline{\hspace{2cm}}$$

$$\overline{YZ} \cong \underline{\hspace{2cm}}$$

$$\overline{TS} \cong \underline{\hspace{2cm}}$$

Given:  $ABCD \cong JKLMN$



$$JN = \underline{\hspace{2cm}}$$

$$CD = \underline{\hspace{2cm}}$$

$$DE = \underline{\hspace{2cm}}$$

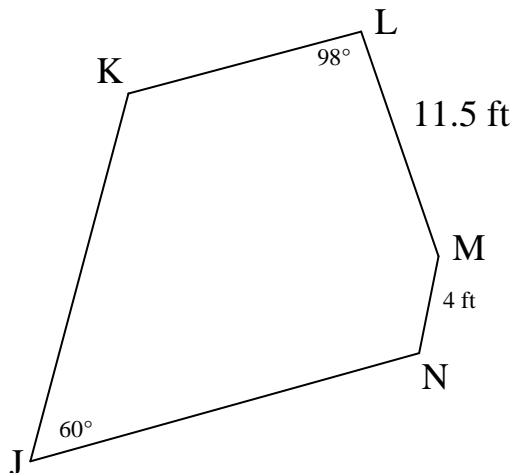
$$KL = \underline{\hspace{2cm}}$$

$$m\angle N = \underline{\hspace{2cm}}$$

$$m\angle A = \underline{\hspace{2cm}}$$

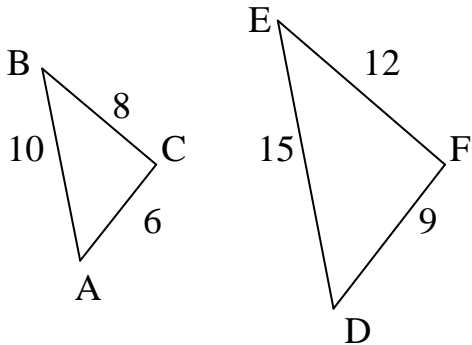
$$m\angle C = \underline{\hspace{2cm}}$$

$$m\angle K = \underline{\hspace{2cm}}$$



# Congruent and Similar Figures

**Similar figures** have corresponding angles that are congruent, BUT HAVE CORRESPONDING SIDES THAT ARE IN PROPORTION!



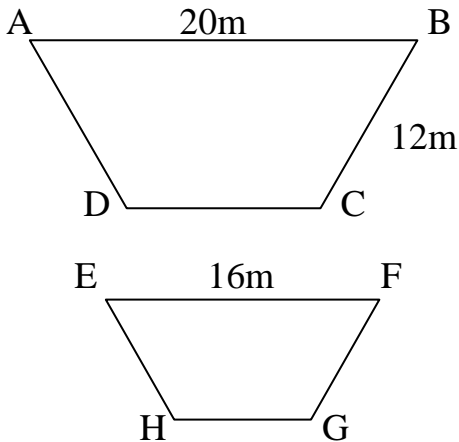
$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$

$$\frac{10}{15} = \frac{8}{12} \qquad \frac{8}{12} = \frac{6}{9}$$

$$120 = 120 \qquad 72 = 72$$

All sides are in proportion!!

Given:  $ABCD \sim EFGH$



Find the length of  $\overline{FG}$ .

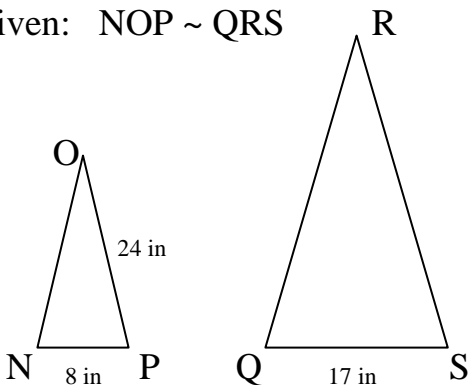
Set up proportion:  $\frac{AB}{EF} = \frac{BC}{FG}$

$$\frac{20}{16} = \frac{12}{x}$$

Solve proportion:  $20x = 192$

$FG = \underline{\hspace{2cm}}$

Given:  $NOP \sim QRS$

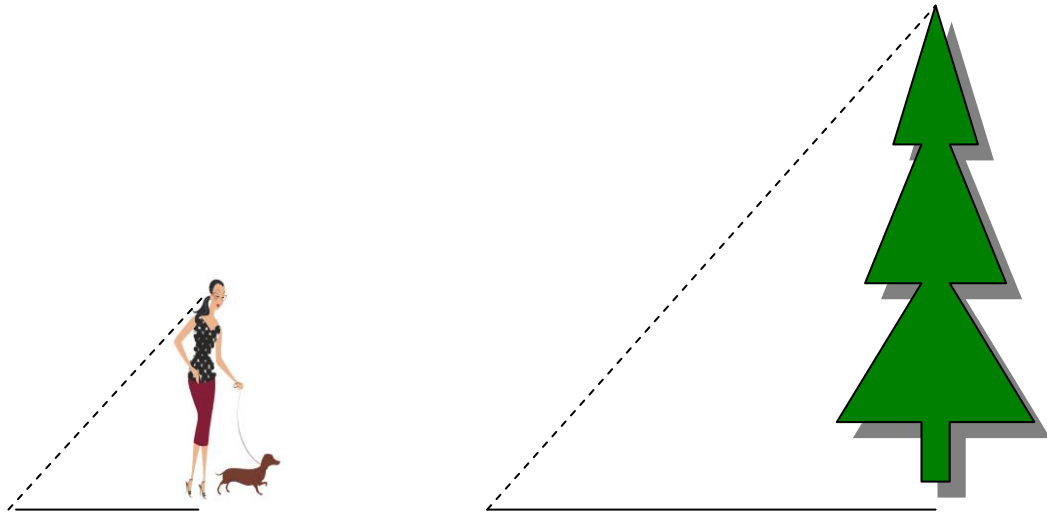


Find the length of  $\overline{RS}$ .

# Congruent and Similar Figures

**Indirect Measurement** uses similar figures to compute distances that are difficult to measure.

Given: A tree casts a shadow that is 10 feet long. A woman who is 5 feet tall casts a shadow that is 4 feet long. Two similar triangles are created. How tall is the tree?



Given: A 6 foot tall man casts a shadow that is 4.5 feet long. A telephone pole casts a shadow that is 15.6 feet long. Two similar triangles are created. How tall is the telephone pole?

