

7.1 & 7.2 Notes (Day 2)

Two polygons that have exactly the same shape but not necessarily the same size are similar.

Two polygons are congruent if that have exactly the same shape & size.

Similar figures must have: symbol: \sim "is similar to"

1. congruent corresponding angles AND
2. sides that are proportional (same side length ratio or SLR)

Congruent figures must have: symbol: \cong "is congruent to"

1. all congruent sides
2. all congruent angles

The ratio of the sides is called the scale factor or SLR

Are congruent figures also similar? Why or why not?

YES! because all \angle s are \cong and sides are proportional (SLR is 1:1)

Are similar figures congruent? Why or why not?

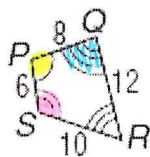
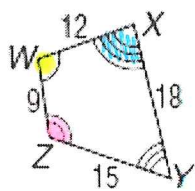
NO! (not always true) - because they do not have to be the same size to be similar, but they MUST be the same size to be congruent.

Example 1: Determine whether each statement is sometimes, always, or never true.

- Two equilateral triangles are congruent. sometimes true
- An equilateral triangle is similar to a scalene triangle. never true
- Two rectangles are similar. sometimes true
- Two isosceles right triangles are congruent. sometimes true
- Two isosceles right triangles are similar. always true
- Two rectangles in which the length is twice the width are similar. always true

Example 2: Determine if the figures are similar. Justify your reasoning as modeled in class.

① All corresponding \angle s are $\cong \checkmark$



$$\frac{WX}{PQ} = \frac{12}{8} = \left(\frac{3}{2}\right)$$

$$\frac{WZ}{PS} = \frac{9}{6} = \left(\frac{3}{2}\right)$$

$$\frac{XY}{QR} = \frac{18}{12} = \left(\frac{3}{2}\right)$$

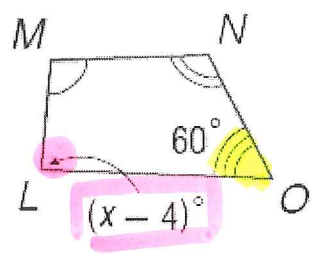
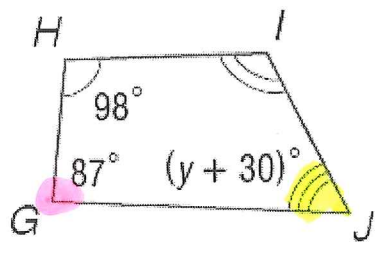
$$\frac{ZY}{SR} = \frac{15}{10} = \left(\frac{3}{2}\right)$$

② SLR = $\frac{3}{2}$
sides are proportional (same SLR)

Therefore, Quad. WXYZ \sim Quad. PQRS

Example 3: Given the two polygons are similar, find x and y.

→ $\angle S$ are \cong AND sides are proportional

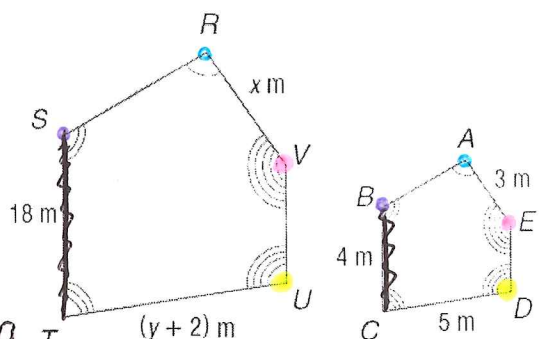


$\angle G \cong \angle L$
 $87^\circ = x - 4$
 $91 = x$

$\angle J \cong \angle O$
 $y + 30 = 60$
 $y = 30$

Example 4: The two polygons are similar.

- A. Write the similarity statement.
- B. Find the scale factor.
- C. Find x and y.
- D. Find the measure of the indicated side.



$\frac{ST}{BC} = \frac{18}{4} = \frac{9}{2} = SLR$

$\frac{RV}{AE} = \frac{9}{2} \Rightarrow \frac{x}{3} = \frac{9}{2}$
 $2x = 27$

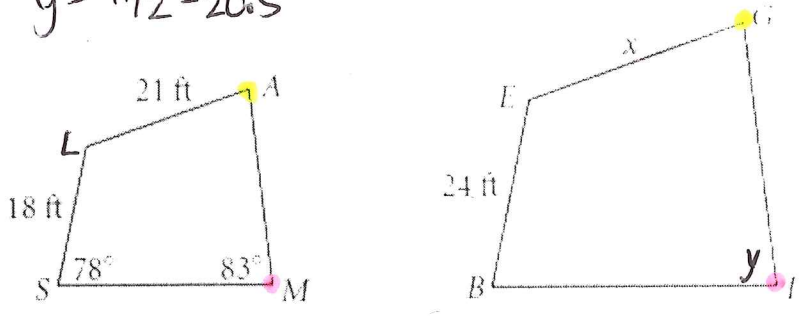
$\frac{TU}{CD} = \frac{9}{2} \Rightarrow \frac{(y+2)}{5} = \frac{9}{2}$
 $2y + 4 = 45$

$2y = 41$

A. Poly DEABC ~ Poly UVRST B. $SLR = 9/2$ C. $x = 27/2 = 13.5$ D. $TU = 20.5 + 2 = 22.5m$

Example 5: The two quadrilaterals are similar.

- A. Write the similarity statement.
- B. Find the scale factor.
- C. Find x and y.
- D. Find the measure of the indicated side.



$\frac{LS}{EB} = \frac{18}{24} = \frac{3}{4}$

$\frac{LA}{EG} = \frac{3}{4} \Rightarrow \frac{21}{x} = \frac{3}{4}$
 $3x = 84$
 $x = 28$

$\angle M \cong \angle I$
 $83^\circ = y$

A. Quad AMSL ~ Quad EIBG B. $SLR = 3/4$ C. $x = 28$ D. $EG = 28ft$
 $y = 83^\circ$