

# Similarity Notes

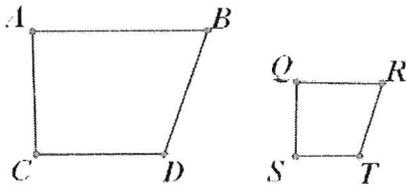
What are similar figures?

figures with the same shape but different size

<http://www.youtube.com/watch?v=1O-ieOZ5y6s&feature=related>

The notation for similar is like a congruence symbol but without the =.

$\triangle ABC \sim \triangle XYZ$  reads triangle ABC is similar to triangle XYZ



Side AB corresponds to side QR

Side BD corresponds to side RT

Side CD corresponds to side ST

Side AC corresponds to side QS

Set up the corresponding sides as a ratio:

$$\frac{\text{Quad. ABDC}}{\text{Quad. QRTS}} \quad \frac{AB}{QR} = \frac{BD}{RT} = \frac{CD}{ST} = \frac{AC}{QS}$$

STOP for time to copy

Their ratios form proportions. We use the proportions to state two equal ratios. When we talk about the ratios above we call them **side length ratios** or **scale factor**.

COMMON ERROR!!!!!! (write the common error below)

$$\frac{AB}{QR} = \frac{RT}{BD} \text{ same spot}$$

STOP to explain

In addition to the sides being proportional, the corresponding angles congruent.

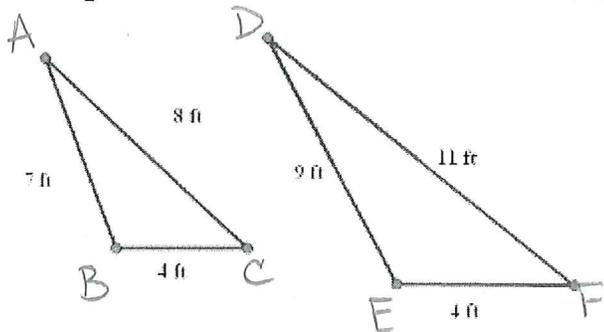
That means  $m\angle A = m\angle Q$

That means  $m\angle B = m\angle R$

That means  $m\angle D = m\angle T$

That means  $m\angle C = m\angle S$

Example #1A



$$\frac{\Delta ABC}{\Delta DEF}$$

$$\frac{AB}{DE} = \frac{7}{9}$$

$$\frac{BC}{EF} = \frac{4}{4} = 1$$

$$\frac{AC}{DF} = \frac{8}{11}$$

Set up **side length ratios (scale factors)** for each side length. Simplify each fraction.

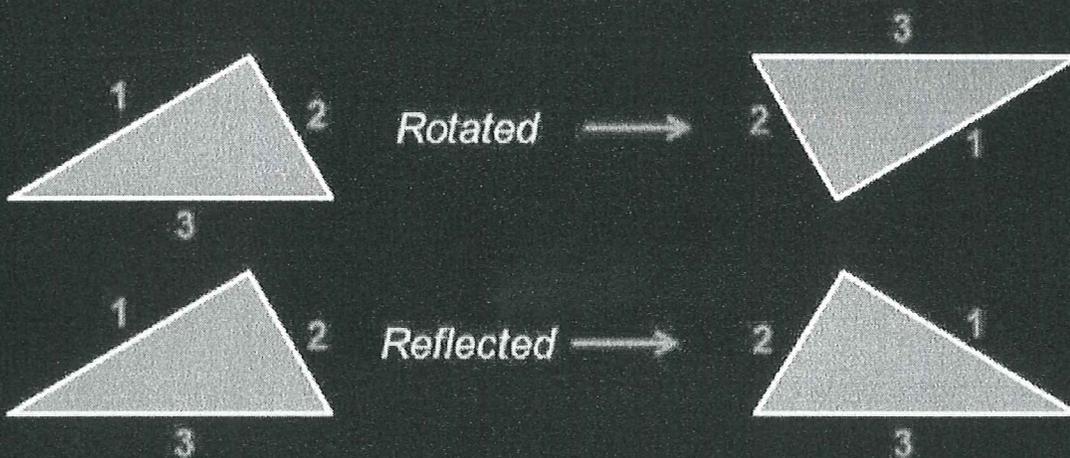
*Stop to answer ↓ SLR*

Are they similar? Why or why not? No because the SLR

are not the same

### Similar Figures

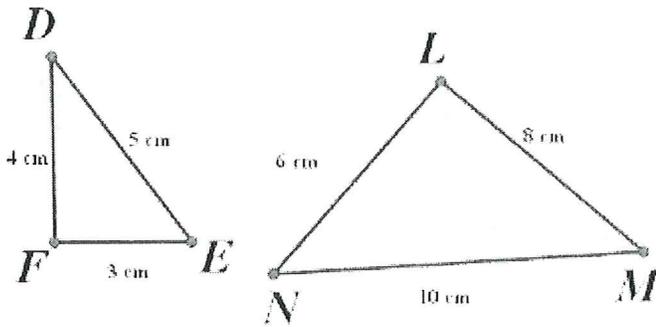
Some similar images may not look similar because they are rotated or reflected.



So, take your time when identifying corresponding sides.

*Stop to think about transformations*

Example #1B

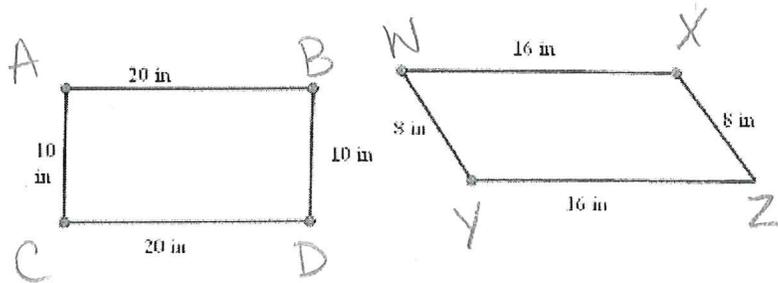


Which sides are corresponding? Set up the scale factors (ratios) Must show the geometry AND the number ratios:

$$SLR = \frac{1}{2}$$

Are the triangles similar? Why or why not?

Yes b/c SLR is the same



Show the sides are proportional, but these figures are not similar because angles are not congruent.

$$\frac{AB}{WX} = \frac{20}{16} = \frac{5}{4}$$

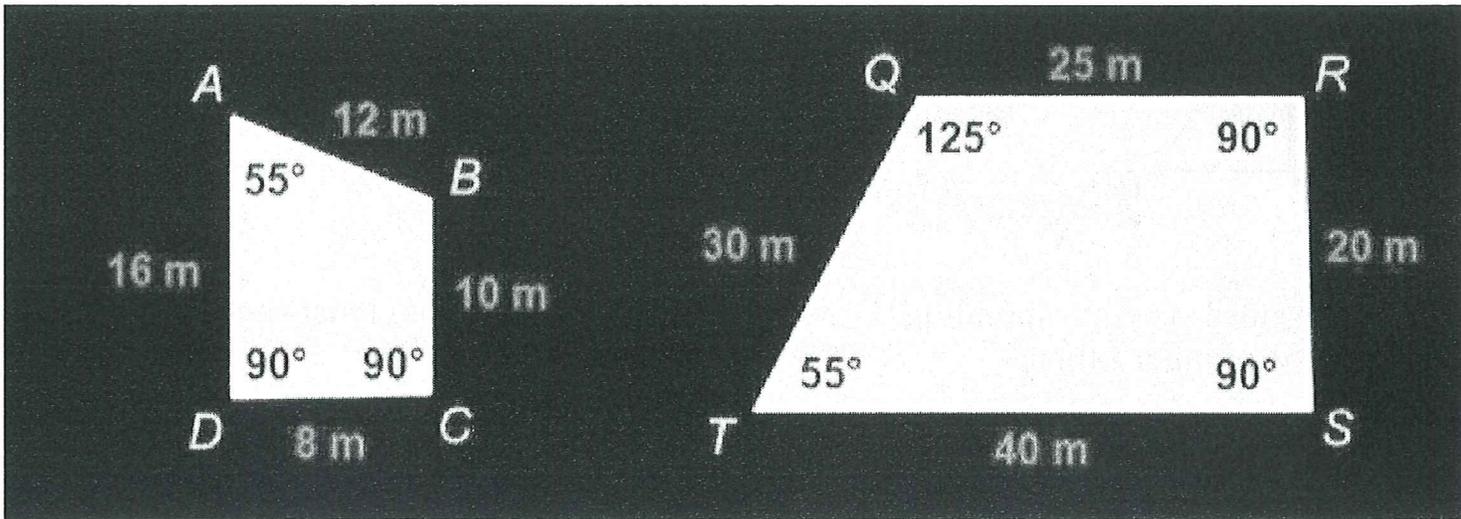
$$\frac{BD}{XZ} = \frac{10}{8} = \frac{5}{4}$$

$$\frac{AC}{WY} = \frac{10}{8} = \frac{5}{4}$$

$$\frac{CD}{YZ} = \frac{20}{16} = \frac{5}{4}$$

STOP to say  
angles  
must  
be  $\cong$  in  
figures w/ 4  
or more sides

Example 2



< A corresponds to < T and both are 55°

< D corresponds to < S and both are 90°

< C corresponds to < R and both are 90°

< B corresponds to < Q and both are 125°

Set up ratios for corresponding sides- **Must show the geometry AND the number ratios!**

*STEP 1*

$$\frac{AB}{TQ} = \frac{12m}{30m} = \frac{2}{5} \quad \frac{AD}{TS} = \frac{16m}{40m} = \frac{2}{5} \quad \frac{DC}{RS} = \frac{8m}{20m} = \frac{2}{5} \quad \frac{BC}{QR} = \frac{10m}{25m} = \frac{2}{5}$$

Are the two figures similar? Why or why not?

Yes because the corresponding angles are congruent and the corresponding sides are proportional (have the same SLR)