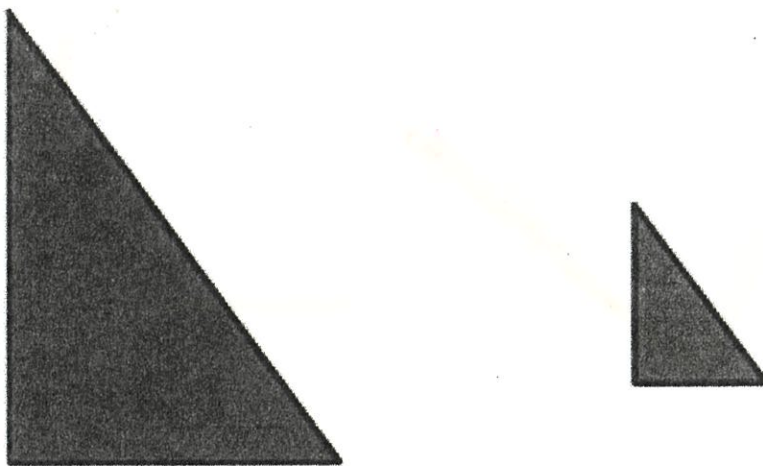


Similar Polygons

I. Similar figures have the same shape but not necessarily the same size.

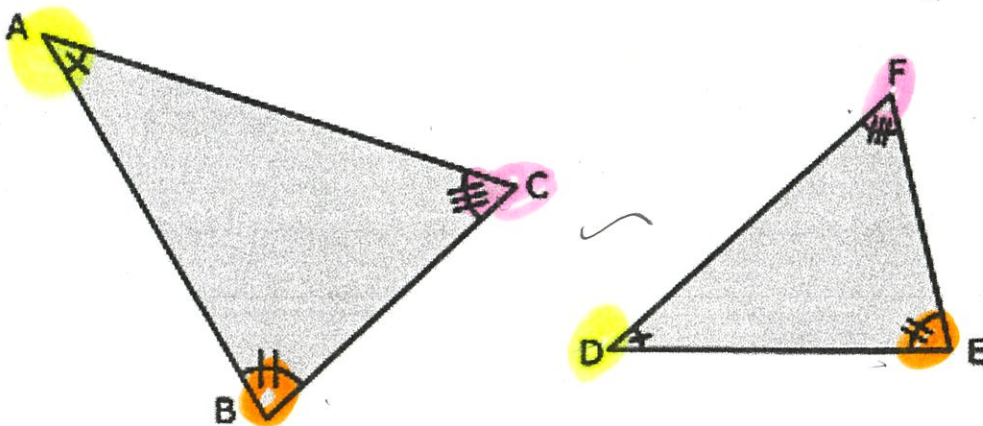


II. Two figures are similar if their corresponding angles are congruent.

①

→ matching → equal
~~≠~~

Corresponding angles: $A \cong D$, $B \cong E$, $C \cong F$



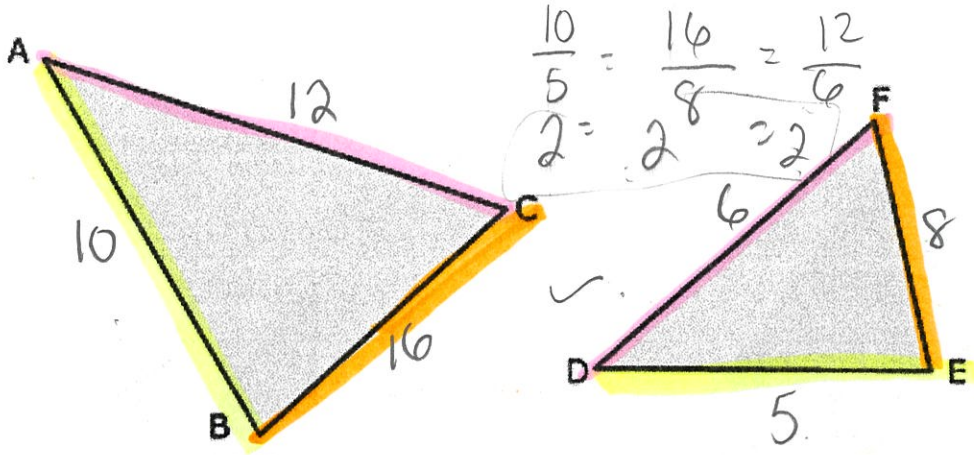
3 pairs of = angles

III. Two figures are similar if their corresponding sides have the same ratio (are in proportion).

2

Corresponding sides: $\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD}$

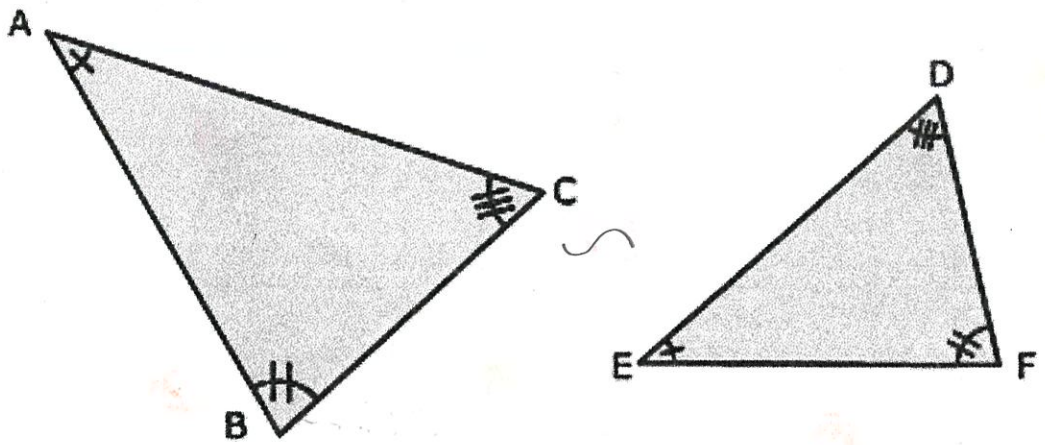
fraction reduces to the same #



IV. A similarity statement indicates two figures are similar. The corresponding vertices are listed in order.

Symbol for "is similar to"

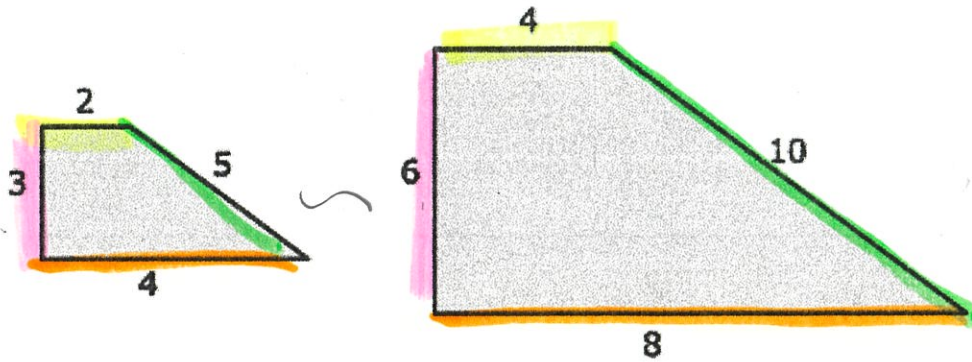
$\triangle ABC \sim \triangle EFD$



V. The ratio of the lengths of the corresponding sides is called the similarity ratio (scale factor).

Similarity ratio

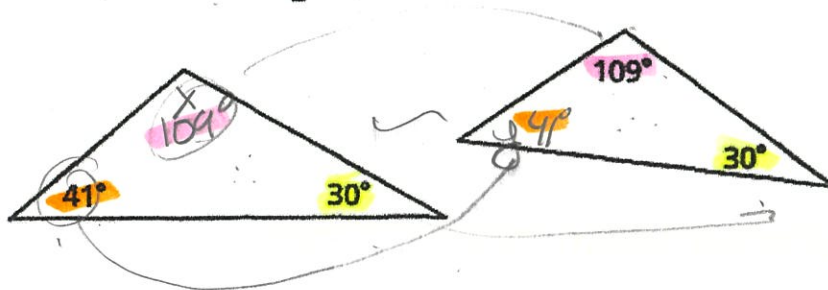
$$\frac{4}{2} = \frac{6}{3} = \frac{8}{4} = \frac{10}{5} = 2$$



VI. Angle-Angle Similarity Postulate - If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar.

Examples:

1. Explain whether the triangles are similar.



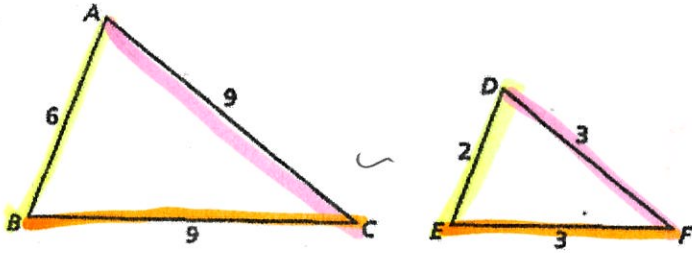
The figure shows only one pair of congruent angles. Find the measure of the third angle in each triangle. Label the angle measures in the figure.

$$\begin{aligned} 41 + 30 + x &= 180 \\ 71 + x &= 180 \\ -71 & \quad -71 \\ \hline x &= 109^\circ \end{aligned}$$

$$\begin{aligned} y + 109 + 30 &= 180 \\ y + 139 &= 180 \\ -139 & \quad -139 \\ \hline y &= 41^\circ \end{aligned}$$

Yes! B/c the corresponding angles are congruent

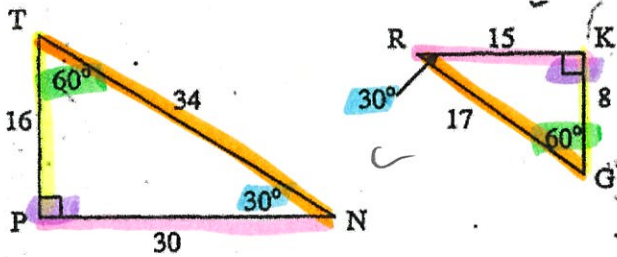
2. Explain whether $\triangle ABC$ and $\triangle DEF$ are similar.



$$\frac{6}{2} = 3 \quad \frac{9}{3} = 3 \quad \frac{9}{3} = 3$$

yes! B/c the corresponding sides are in proportion. \leftarrow (have the same ratio)

3. Are the following triangles similar? Why or why not?



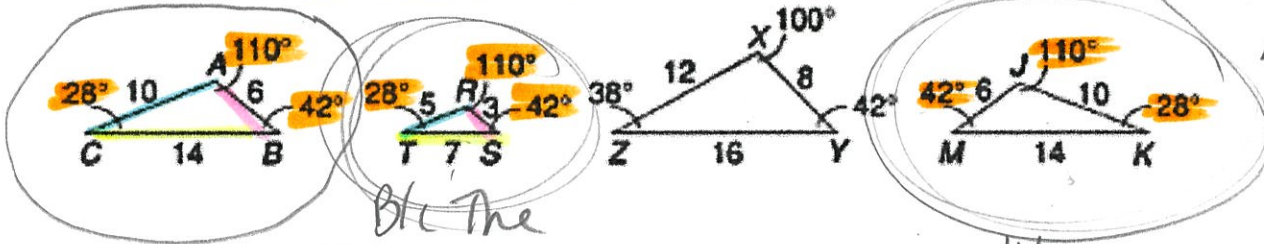
①

$$\frac{16}{8} = 2 \quad \frac{30}{15} = 2 \quad \frac{34}{17} = 2$$

Yes! B/c the corresponding sides are in proportion

② Corresponding angles are congruent

4. Which triangles are similar to $\triangle ABC$? Why are they similar?



$\triangle RST$ and $\triangle JMK$ are similar to $\triangle ABC$

$$\frac{14}{7} = 2$$

$$\frac{10}{5} = 2$$

$$\frac{6}{3} = 2$$

B/c the

① corresponding angles are congruent

② corresponding sides are in proportion

$$\frac{14}{14} = 1$$

$$\frac{10}{10} = 1$$

$$\frac{6}{6} = 1$$

Exploring Similar Figures (Continued)

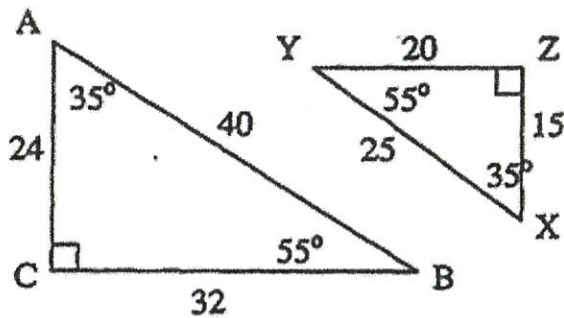
Similar Figures - Polygons that have the same shape, but different size.

Corresponding - Have the same position.

Two polygons are similar if:

1. Corresponding angles are congruent **AND**
2. The lengths of corresponding sides are in proportion, called the scale factor.

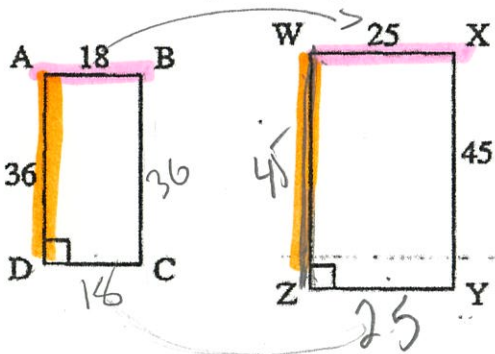
Example: Show if the triangles below are similar or not.



When two polygons are similar, we can write a similarity statement using the symbol " \sim ".

More Examples:

1. Are the following rectangles similar? Why or why not?

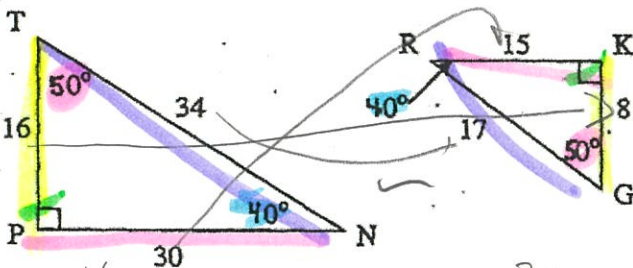


$$\frac{18}{25} = .72$$

$$\frac{36}{45} = .8$$

No! B/C the corresponding sides are not in proportion.

2. Are the following triangles similar? Why or why not?



$$\frac{16}{8} = 2$$

$$\frac{30}{15} = 2$$

$$\frac{34}{17} = 2$$

Yes! B/C the
 ① Corresponding sides are in proportion
 ② Corresponding angles are congruent

