

Name: _____

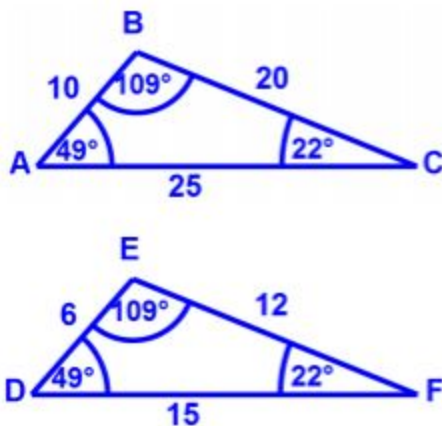
Group: _____

SIMILAR FIGURES

We will learn how to determine if two figures are similar or not.

→ For two polygons to be **similar** they must have corresponding **angles** that are **congruent** AND the corresponding sides must be **proportional**.

Example 1: We're going to show how triangle ABC is SIMILAR(~) to DEF.



FIRST: Notice how we name the triangles...It means that

$$\angle A = \angle D$$

$$\angle B = \angle E$$

$$\angle C = \angle F$$

This is showing us that the **corresponding** angles are **congruent**.

SECOND: We use the corresponding

letters to determine the **corresponding** sides. AND check if corresponding sides are **proportional**:

$$\frac{\overline{AB}}{\overline{DE}} = \frac{\overline{BC}}{\overline{EF}} = \frac{\overline{CA}}{\overline{FD}}$$

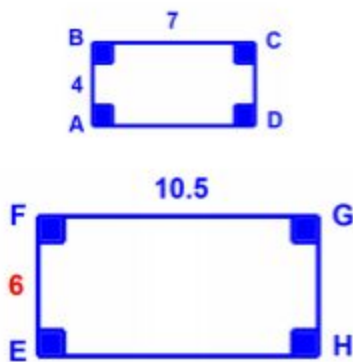
$$\frac{10}{6} = \frac{20}{12} = \frac{25}{15}$$

$$1.\overline{66} = 1.\overline{66} = 1.\overline{66}$$

NOTE: for *triangles* only **one** of the conditions needs to be met; that is, for triangles, their corresponding angles must be **congruent** **OR** their corresponding sides must be **proportional**.

→ If we know that two polygons are similar, we can find unknown measurements in the given polygons.

Example 2: Determine the missing measurement x in the rectangles below where rectangle ABCD ~ rectangle EFGH:



FIRST: We identify which sides are proportional to each other by setting up the proportions:

$$\frac{\overline{mAB}}{\overline{mEF}} = \frac{\overline{mBC}}{\overline{mFG}}$$

$$\frac{4}{x} = \frac{7}{10.5}$$

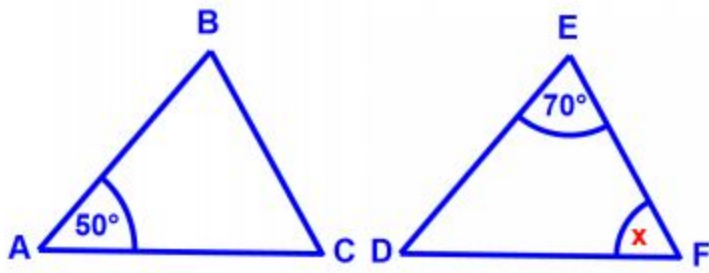
$$(4)(10.5) = (x)(7)$$

$$42 = (x)(7)$$

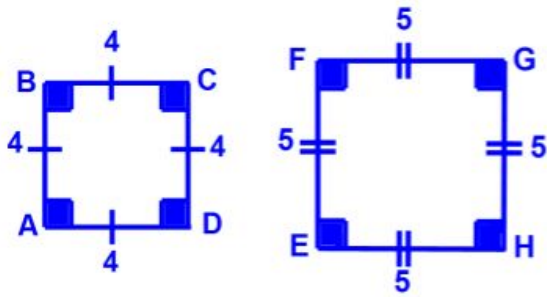
$$\frac{42}{7} = x$$

$$x = 6$$

Example 3: Solve for the missing angle x .



Example 4: Determine whether the following shapes are similar and explain why:



$$\frac{\overline{mAB}}{\overline{mEF}} = \frac{\overline{mBC}}{\overline{mFG}} = \frac{\overline{mCD}}{\overline{mGH}} = \frac{\overline{mDA}}{\overline{mHE}}$$

$$\frac{4}{5} = \frac{4}{5} = \frac{4}{5} = \frac{4}{5}$$