Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ratios in Similar Polygons

Fill in the blanks to complete each definition.

* A similarity ratio is the ratio of the lengths of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sides of two similar polygons.
* Two polygons are similar if and only if they meet the following criteria:
1. Corresponding angles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Corresponding sides are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**ΔABC ΔDEF**

* Similar polygons have the same shape but not necessarily the same

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* Similarity statement:

Use the figure for Exercises 1 and 2. ∆ABC ~ ∆FED

 1. Name the pairs of congruent angles.

 ∠A ≅

 ∠B ≅

 ∠C ≅

 2. Write the corresponding side lengths in the proportion. $\frac{ }{ AB }=\frac{ DE }{ }=\frac{ }{ FD }$

Use the figure to the right for Exercises 3 and 4. The triangles are similar.

 3. Circle the correct similarity statement.

 ΔQRS ~ ΔKJL ΔRSQ ~ ΔKJL ΔQSR ~ ΔLKJ

 4. Write the corresponding side lengths in the proportion.

 $\frac{ }{ RS }=\frac{ KL }{ }=\frac{ }{ }$

Use the figure to the right for Exercise 5.

 5. Substitute numbers for the side lengths and reduce each ratio to simplest form.

$\frac{MN}{DG}$ = \_\_\_\_\_\_\_ $\frac{ML}{DE}$ = \_\_\_\_\_\_\_ = \_\_\_\_\_\_\_

Use the figure to the right for Exercise 6.

6. ABCD ~ EFGH. Solve for x.

Use the figure to the right for Exercise 7.

7. Solve for x and y.

Word Problem: A tree cast a shadow 18 feet long. At the same time a person who is 6 feet tall cast a shadow 4 feet long. How tall is the tree?

$$\frac{ }{ }=\frac{ }{ }$$

Ratios of similar polygons — Corresponding side: Corresponding side

OR

**Perimeter: Perimeter Area: Area Volume: Volume**

**\_\_\_\_\_\_\_\_\_:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_:\_\_\_\_\_\_\_\_\_**

Example: *Find the perimeter of the smaller triangle.*



**Example: *The ratio of the perimeters of two similar polygons equals the ratio of any pair of corresponding sides.*

*The ratio of the perimeters of CAT to DOG is 3:2. Find the value of y.*

**Scale Factor**

Scale Factor – the ratio of corresponding sides

* **When scale factor is greater than 1, the shape gets *bigger and* this is called an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
* **When scale factor is less than 1, but greater than 0, the shape gets *smaller* and this is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
* **Formula: \_\_\_\_\_\_\_\_\_\_**

**Dilations**

Apply the dilation *D* to the polygon with the given vertices. Name the coordinates of the image points. Identify and describe the transformation as an enlargement or reduction.

8. *D* (*x*, y) → 
*A*(4, 10), *B*(–6, 4), and *C*(4, –4)

 

A’ \_\_\_\_\_\_\_\_\_, B’ \_\_\_\_\_\_\_\_\_, and C’ \_\_\_\_\_\_\_\_\_

This shape is a/n \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The scale factor is \_\_\_\_\_\_\_\_\_.

9. *D* (*x*, y) → (3*x*, 3*y*)

![[image]]() *P*(1, –1), *Q*(2, 1), *R*(–2, 1)

**P’ \_\_\_\_\_\_\_\_\_, Q’ \_\_\_\_\_\_\_\_\_, and R’\_\_\_\_\_\_\_\_\_**

This shape is a/n \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The scale factor is \_\_\_\_\_\_\_\_\_.