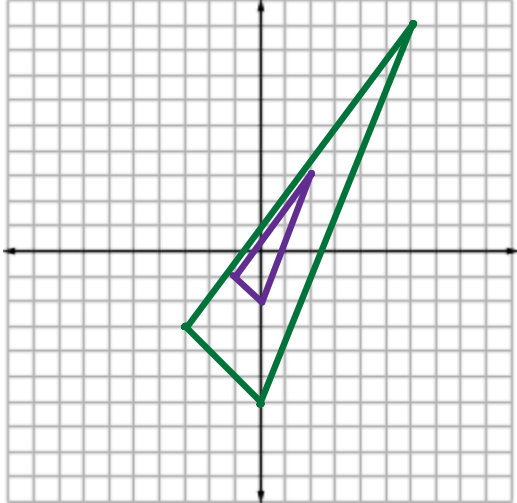
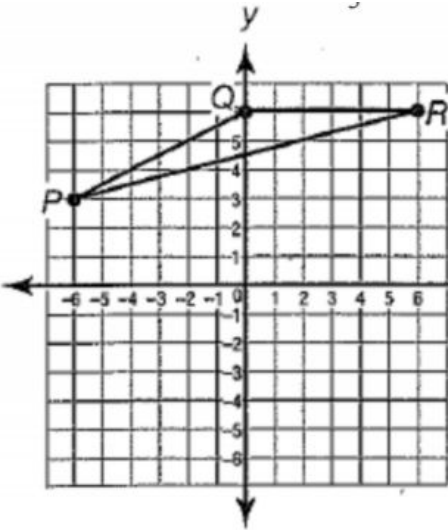
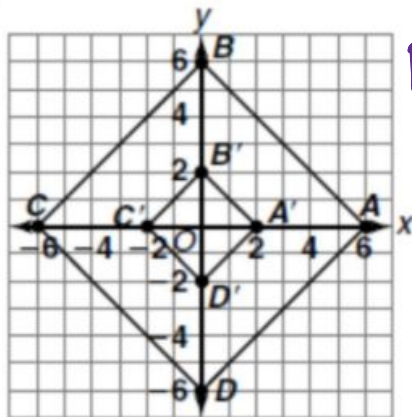


6.2.1-6.2.6 Similarity NOTES

Dilation	<p>Transforming a graphed shape by <u>multiplying</u> each <u>coordinate</u> by the same number.</p> <p>Enlarges (gets bigger) when multiply ALL coordinates by a number <u>bigger than 1</u></p> <p>Reduces (gets smaller) when multiply ALL coordinates by a number <u>between 0 and 1</u></p> <p>Reflects over x- and y-axis (or 180 rotation) if multiply ALL coordinates by <u>a negative number</u></p>
<p><u>Example 1:</u> Dilate triangle DEF by a scale factor of 3 with the points D(2,3) E(-1,- 1) and F(0,-2). Graph the original triangle and the triangle after the dilation. What are the coordinates of D'E'F'?</p>	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p style="color: green; font-size: 1.2em;">D' (6, 9)</p> <p style="color: green; font-size: 1.2em;">E' (-3, -3)</p> <p style="color: green; font-size: 1.2em;">F' (0, -6)</p> </div>  </div>
<p><u>Example 2:</u> What are the coordinates of P'Q'R' after a $\frac{2}{3}$ dilation of PQR?</p>	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p style="color: purple; font-size: 1.2em;">R (6,6) R' (4,4)</p> <p style="color: purple; font-size: 1.2em;">Q (0,6) Q' (0,4)</p> <p style="color: purple; font-size: 1.2em;">P (-6,3) P' (-4,2)</p> <p style="color: green; font-size: 1.2em;">$6 \cdot \frac{2}{3} = \frac{12}{3} = 4$</p> <p style="color: green; font-size: 1.2em;">$3 \cdot \frac{2}{3} = \frac{6}{3} = 2$</p> </div> </div>

Example 3:
 Quadrilateral $A'B'C'D'$ is a dilation of quadrilateral $ABCD$. Find the scale factor. Classify the dilation as an enlargement or a reduction.



Reduction
 $B(0,6)$ $B'(0,2)$
 $\frac{2}{6} = \boxed{\frac{1}{3}}$

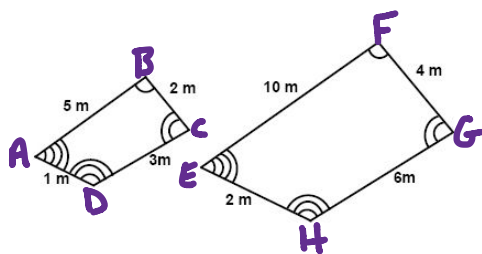
Scale Factor
 (Similarity Ratio)

The number you multiply the lengths of the sides of an original shape by to get the lengths of the new sides of the new shape.

Similar Polygons

Similar polygons have the same angles and proportional sides.

Symbolic Notation
 and Example



$$\frac{4}{2} = 2 \quad \frac{10}{5} = 2$$

$$\frac{6}{3} = 2 \quad \frac{2}{1} = 2$$

Notation:

$$ABCD \sim EFGH$$

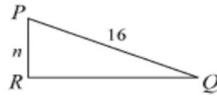
$$CDAB \sim GHEF$$

Scale Factor:

2

Proportionality Statement:

Example 3:
 Given $\triangle GHI \sim \triangle PQR$,
 find the scale factor
 and n.



$$\frac{16}{7}$$

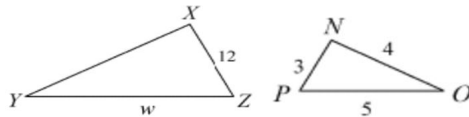
$$3 \cdot \frac{16}{7} = \boxed{\frac{48}{7}}$$

$$\frac{n}{3} = \frac{16}{7}$$

$$\frac{n}{3} = \frac{48}{7}$$

$$\boxed{n = \frac{48}{7}}$$

Example 4:
 Given $\triangle NOP \sim \triangle XYZ$,
 find the scale factor
 and w.



$$\frac{12}{3} = 4 \text{ Scale Factor}$$

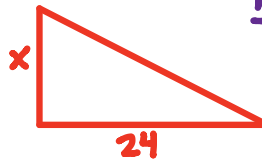
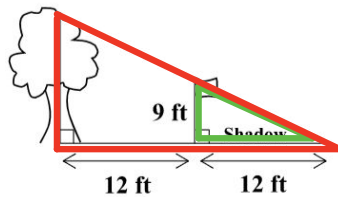
$$5 \cdot 4 = \boxed{20}$$

$$\frac{w}{5} = \frac{12}{3}$$

$$\frac{w}{5} = \frac{60}{3}$$

$$\boxed{w = 20}$$

Example 5:
 A 9-foot flagpole stands 12 feet from the foot of an oak tree. If the shadow of the flagpole is 12 feet long, how tall is the tree?



Proportion

$$\frac{24}{12} = \frac{x}{9}$$

$$\frac{12x}{12} = \frac{216}{12}$$

$$\boxed{x = 18}$$

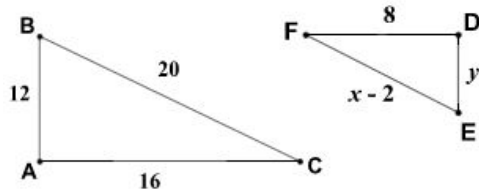
Scale Factor

$$\frac{24}{12} = 2$$

$$9 \cdot 2 = \boxed{18}$$

Example 6:

In the figure to the right, $\triangle ABC \sim \triangle DEF$. Find the values of x and y .



Example 7:

A model boxcar has a length of 7 inches and a height of 2 inches. If the actual length is 50 feet, what is the actual height?

Summary