

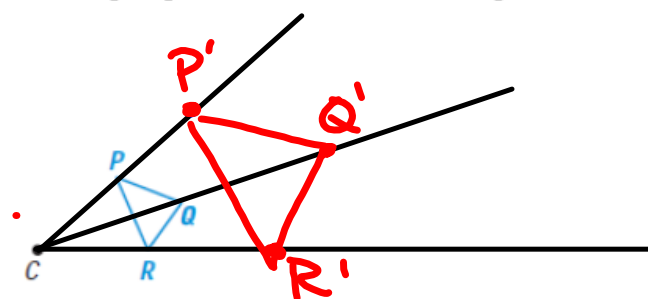
Geometry

7.6: Dilations

Name: _____

🎯 Students will be able to identify and draw dilations. Students will also use information about dilations to create proportions and find missing lengths and distances.

We are going to do a **dilation** of a triangle. Let's make it twice as big.



1. Use your ruler to draw lines from C through P, Q, and R.
2. Measure \overline{CP} in centimeters. $CP = \underline{11.6\text{cm}}$
3. We want CP' to be twice as long. $CP' = \underline{23.2\text{cm}}$. Use your ruler to locate P' .
4. Now repeat steps 2 and 3 for \overline{CQ} and \overline{CR} .
 $CQ = \underline{17.2\text{cm}}$ so $CQ' = \underline{34.4\text{cm}}$
 $CR = \underline{13\text{cm}}$ so $CR' = \underline{26\text{cm}}$.
5. Now connect P' , Q' and R' to make the new triangle.

$$\triangle PQR \sim \triangle P'Q'R'$$

☆Dilation: Transformation that stretches or shrinks a figure to create a similar figure.



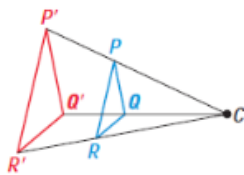
Types of Dilations:

If the image is smaller than the original figure, then the dilation is a reduction

If the image is larger than the original figure, then the dilation is an enlargement

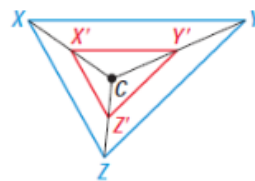
Example 1: Tell whether the dilation is a reduction or an enlargement.

a.



enlargement

b.



reduction

* Which one (red or blue) is the original?

* How does the other figure compare in size to the original?

Coordinate Notation for a Dilation:

You can describe a dilation with respect to the origin with the notation $(x, y) \rightarrow (kx, ky)$, where k is the scale factor.

If $0 < k < 1$, the dilation is a reduction. If $k > 1$, the dilation is an enlargement.

Example 2: State whether the dilation using the scale factor k results in a reduction or an enlargement of the original figure.

a. $k = 3$

enlargement

b. $k = \frac{1}{3}$

reduction

*

c. $k = \frac{5}{4} = 1\frac{1}{4}$

enlargement

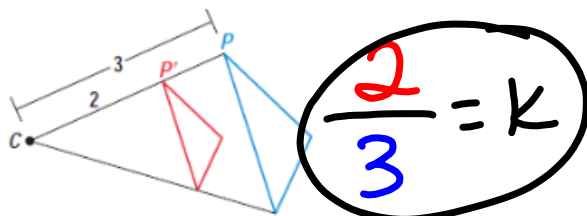
d. $k = 0.93$

reduction

* Be aware
of improper
fractions

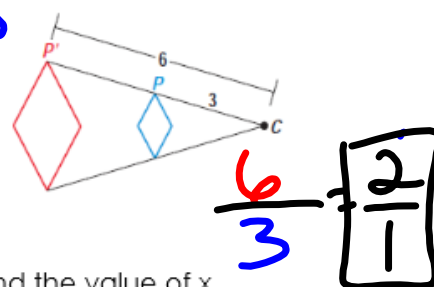
Example 3: Find the scale factor, k , of the dilation.

a.

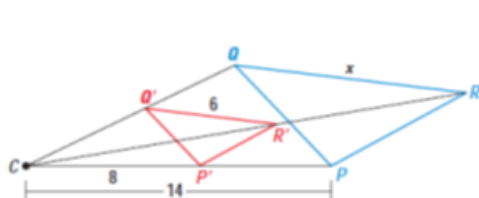


NEW
OLD

b.



Example 4: $\triangle P'Q'R'$ is the image of $\triangle PQR$ after a reduction. Find the value of x .



$$\frac{8}{14} = \boxed{\frac{4}{7}} = \text{Scale Factor}$$

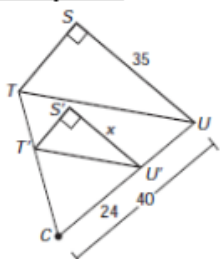
$$\frac{4}{7} = \frac{6}{x}$$

$$4x = 7 \cdot 6$$

$$\frac{4x}{4} = \frac{42}{4}$$

$$\boxed{x = 10.5}$$

Example 5: $\triangle S'T'U'$ is the image of $\triangle STU$ after a reduction. Find the value of x .



$$\frac{24}{40} = \boxed{\frac{3}{5}} = \text{Scale Factor}$$

$$\frac{3}{5} = \frac{x}{35}$$

$$3 \cdot 35 = 5x$$

$$\frac{105}{5} = \frac{5x}{5}$$

$$\boxed{x = 21}$$

Homework: pg. 396-397: #6 - 17 all