

Geometry 9.6

Draw dilations

Draw dilations in the coordinate plane

dilation (scaling)

center (of dilation)

(0, 0) if coord. plane

scale factor — *SF > 1*

enlargement ←

reduction ←

SF < 1

isometry *(not)*

Quiz Tues. 9.4-9.5

dilation practice WS

2 Dilations in the Coordinate Plane

You can use the following rules to find the image of a figure after a dilation centered at the origin.

StudyTip

Negative Scale Factors
Dilations can also have negative scale factors. You will investigate this type of dilation in Exercise 36.

KeyConcept Dilations in the Coordinate Plane

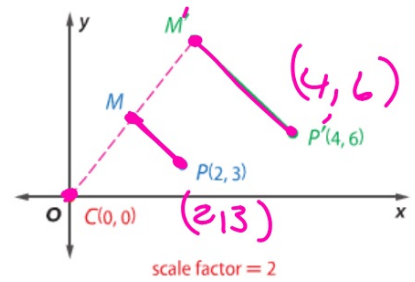
Words

To find the coordinates of an image after a dilation centered at the origin, multiply the x - and y -coordinates of each point on the preimage by the scale factor of the dilation, k .

Symbols

$(x, y) \rightarrow (kx, ky)$

Example



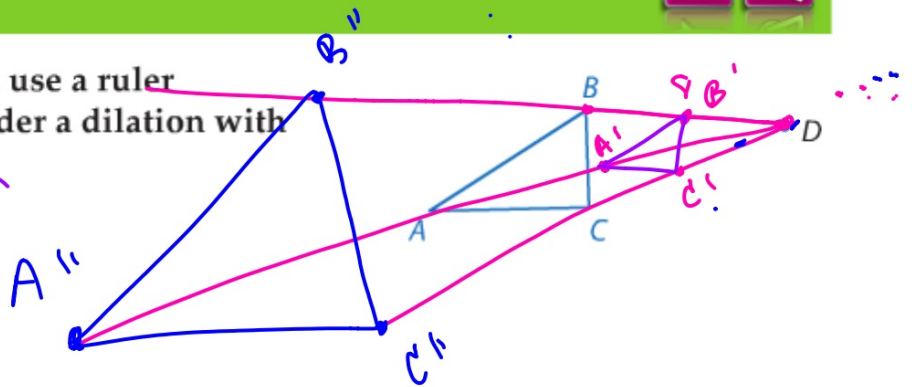
$$F \cdot (2, 3) \rightarrow (4, 6)$$
 ↑

SFx preimage

Example 1 Draw a Dilation

Copy $\triangle ABC$ and point D . Then use a ruler to draw the image of $\triangle ABC$ under a dilation with center D and scale factor $\frac{1}{2}$.


~~$\frac{1}{2}$~~ 2



1. Draw ray (direction) from Center to point A
2. Measure distance (from Center to A)
3. Apply SF to distance
4. Measure and mark image A' (always from Center)
5. Repeat for each point

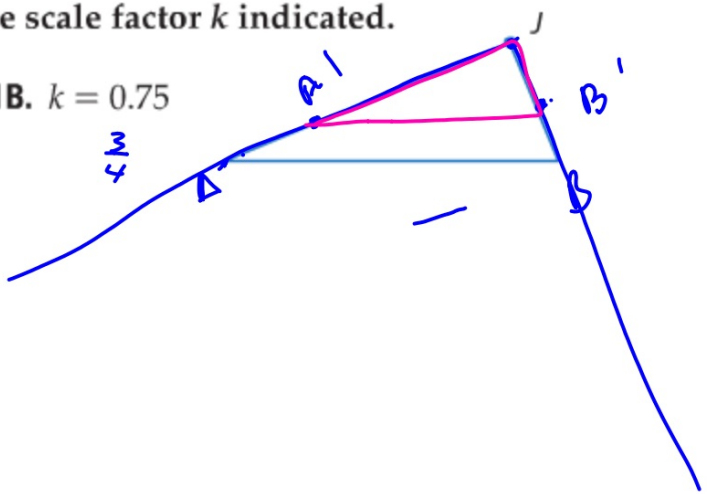
Copy the figure and point J . Then use a ruler to draw the image of the figure under a dilation with center J and the scale factor k indicated.

1A. $k = \frac{3}{2}$



J

1B. $k = 0.75$



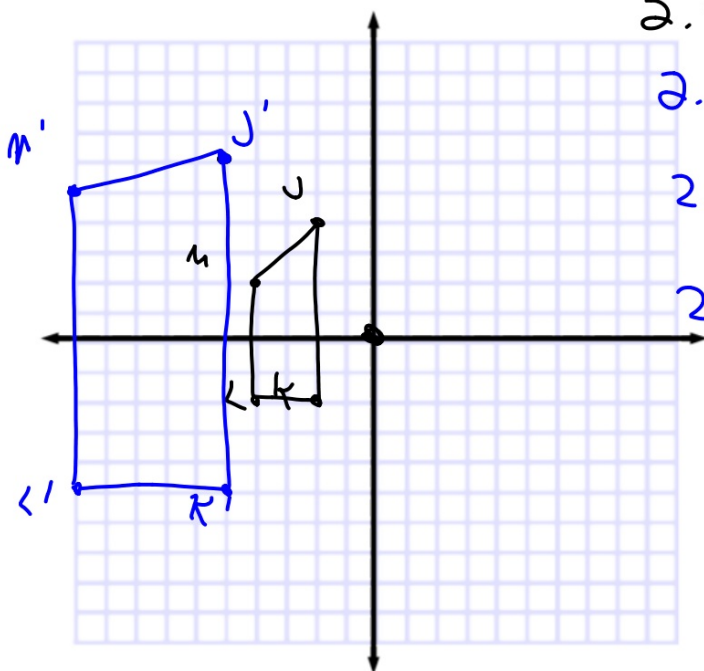
A' B' J A B

Dilation handout
(if time)



Example 3 Dilations in the Coordinate Plane

Quadrilateral $JKLM$ has vertices $J(-2, 4)$, $K(-2, -2)$, $L(-4, -2)$, and $M(-4, 2)$. Graph the image of $JKLM$ after a dilation centered at the origin with a scale factor of 2.5.



$$\begin{aligned}
 &2.5 \overset{J}{(-2, 4)} \quad \overset{J'}{(-5, 10)} \\
 &2.5 \overset{K}{(-2, -2)} \quad \overset{K'}{(-5, -5)} \\
 &2.5 \overset{L}{(-4, -2)} \quad \overset{L'}{(-10, -5)} \\
 &2.5 \overset{M}{(-4, 2)} \quad \overset{M'}{(-10, 5)}
 \end{aligned}$$

9.6 P.677

9-270

43-550