

Dilation: A transformation that makes a object get bigger or smaller.

Rule:  $D_k(x,y) = (kx,ky)$

Ex.

1.  $D_2(-3,-1) = (-6,-2)$   
 $2(-3) = -6$   
 $2(-1) = -2$

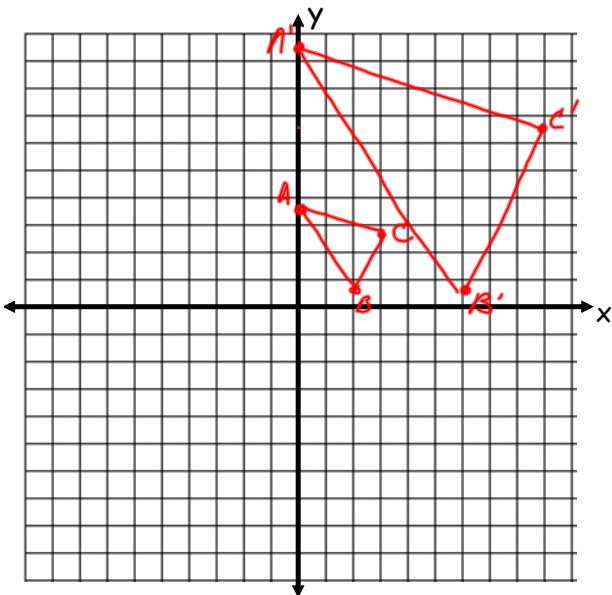
2.  $D_{-3}(4,-2) = (-12,+6)$

Write the single rule for each of the dilations:

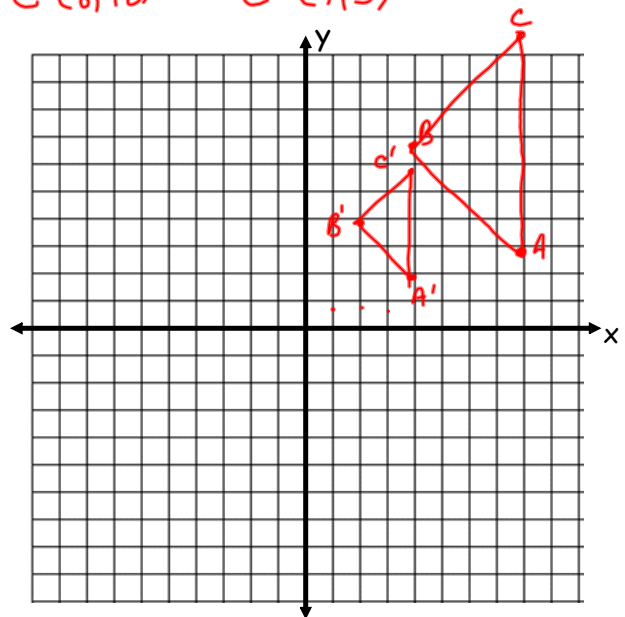
$A(10,4) \rightarrow A'(5,2)$        $D_k$   $B(0,9) \rightarrow B'(0,-3)$   
 $D_k(10,4) = (10k,4k)$        $0k = 0$        $9k = -3$   
 $\frac{10k}{10} = \frac{5}{10} \Rightarrow k = \frac{1}{2}$        $\frac{9k}{9} = \frac{-3}{9}$   
 $D_{\frac{1}{2}}$        $D_{-\frac{1}{3}}$

$D_k$   $C(4,6) \rightarrow C'(6,9)$   
 $4k = 6$        $6k = 9$   
 $\frac{4k}{4} = \frac{6}{4}$        $\frac{6k}{6} = \frac{9}{6}$   
 $k = \frac{3}{2}$        $D_{\frac{3}{2}}$

1.  $A(0,3), B(2,0), C(3,2); D_3$   
 $A(0,3) \xrightarrow{D_3} A'(0,9)$   
 $B(2,0) \rightarrow B'(6,0)$   
 $C(3,2) \rightarrow C'(9,6)$



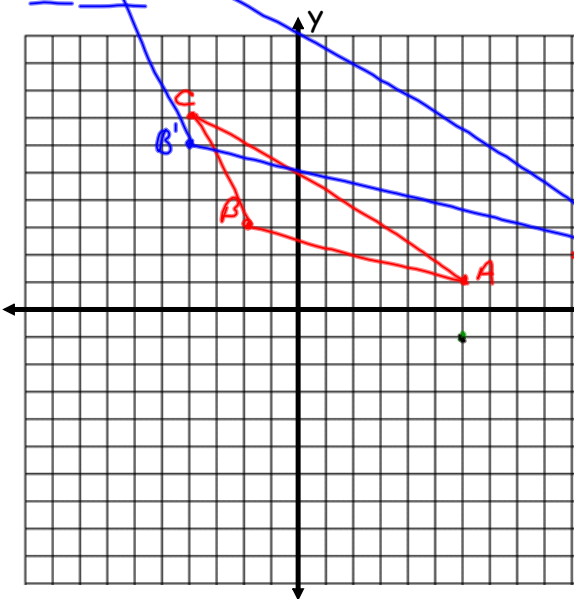
2.  $A(8,2), B(4,6), C(8,10); D_{\frac{1}{2}}$   
 $A(8,2) \rightarrow A'(4,1)$   
 $B(4,6) \rightarrow B'(2,3)$   
 $C(8,10) \rightarrow C'(4,5)$



3. Find the coordinates of P', the image of P(4, -5) under the composition of transformations:  $D_2$  followed by  $r_{x\text{-axis}}$

$$P(4, -5) \xrightarrow{D_2} (8, -10) \xrightarrow{r_{x\text{-axis}}} (8, 10)$$

4.  $A(6, 1), B(-2, 3), C(-4, 7); D_2$



5.  $A(2, 5), B(7, -3), C(4, 6); D_{-3}$   
List the points.

$$\begin{array}{l}
 A(2, 5) \xrightarrow{D_{-3}} A'(-4, 1) \\
 B(7, -3) \xrightarrow{D_{-3}} B'(-14, 9) \\
 C(4, 6) \xrightarrow{D_{-3}} C'(-12, 18)
 \end{array}$$

Dilations do not preserve distance.