Warm Up

Give the coordinates of a point twice as far from the origin in the same direction from the origin.

1. (3, 5) (6, 10)

2. $\left(\frac{1}{2}, -\frac{1}{2}\right)$ (1, -1)

Give the coordinates of a point half as far from the origin in the same direction from the origin.

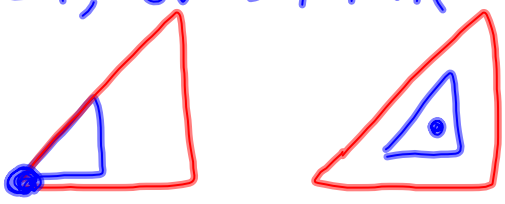
3. (6, -4) (3, -2)

4. (0, 7) (0, 3.5)

6-7 Similarity Transformations

Dilation - changing size, but not shape
stretch, or shrink

Center of dilation -



Scale factor of a dilation - k = amount of stretch or shrink

Coordinate notation for a dilation -

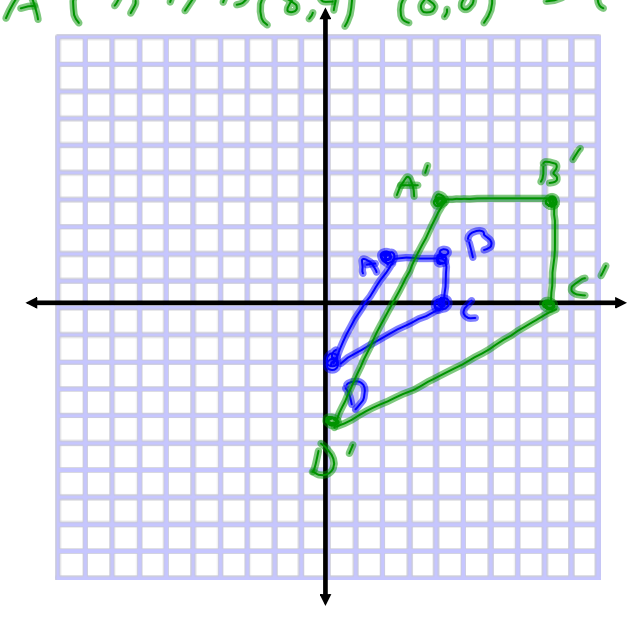
$(x, y) \rightarrow (kx, ky)$

Reduction - $0 < k < 1$

Enlargement - $k > 1$

Ex 1 Draw a dilation of quadrilateral $ABCD$ with vertices $A(2, 2)$, $B(4, 2)$, $C(4, 0)$, $D(0, -2)$. Use a scale factorof 2.

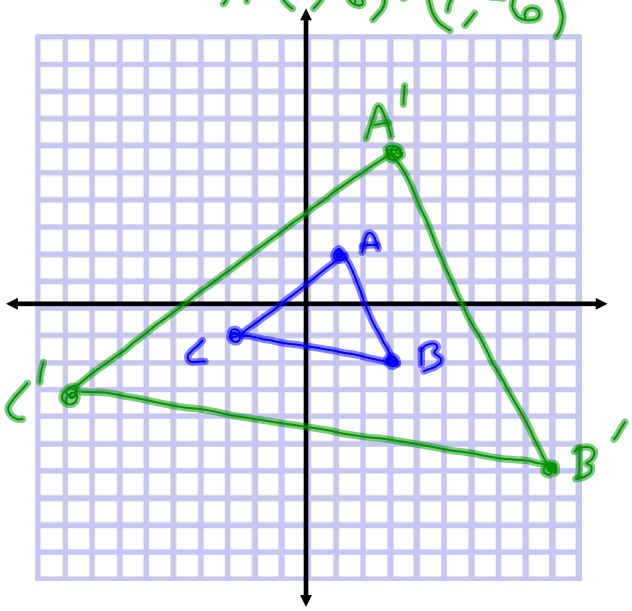
$A'(4,4)$ $B'(8,4)$ $C'(8,0)$ $D'(0,-4)$



Ex. 2 Draw a dilation of ΔABC with vertices $A(1, 2)$, $B(3, -2)$, and $C(-3, -1)$ with a scale factor of 3.

$C'(-9, -3)$

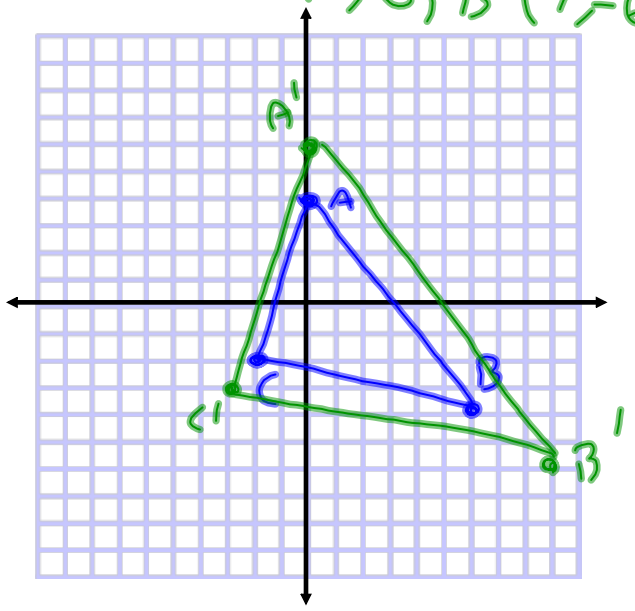
$A'(3, 6)$ $B(9, -6)$



Ex. 3 Draw a dilation of ΔABC with vertices $A(0, 4)$, $B(6, -4)$, and $C(-2, -2)$ with a scale factor of 1.5.

$C(-3, -3)$

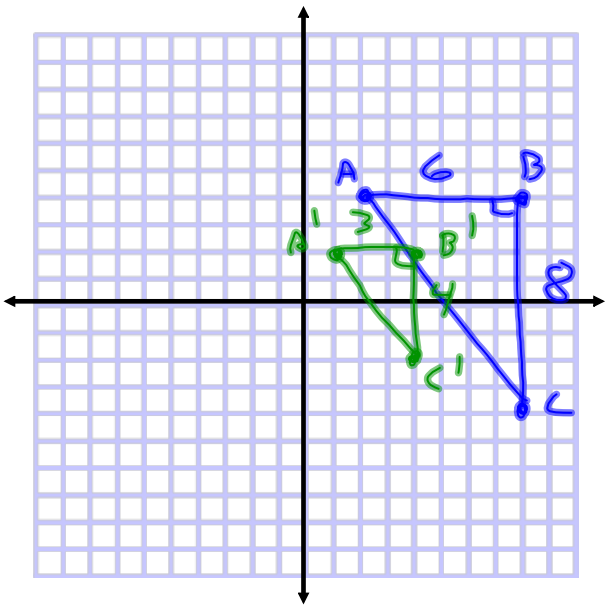
$A'(0, 6)$ $B'(9, -6)$



Ex 4 A triangle has vertices $A(2, 4)$, $B(8, 4)$, and $C(8, -4)$. The image of triangle ABC after a dilation with a scale factor of $\frac{1}{2}$ is triangle DEF.

Sketch ΔABC and ΔDEF

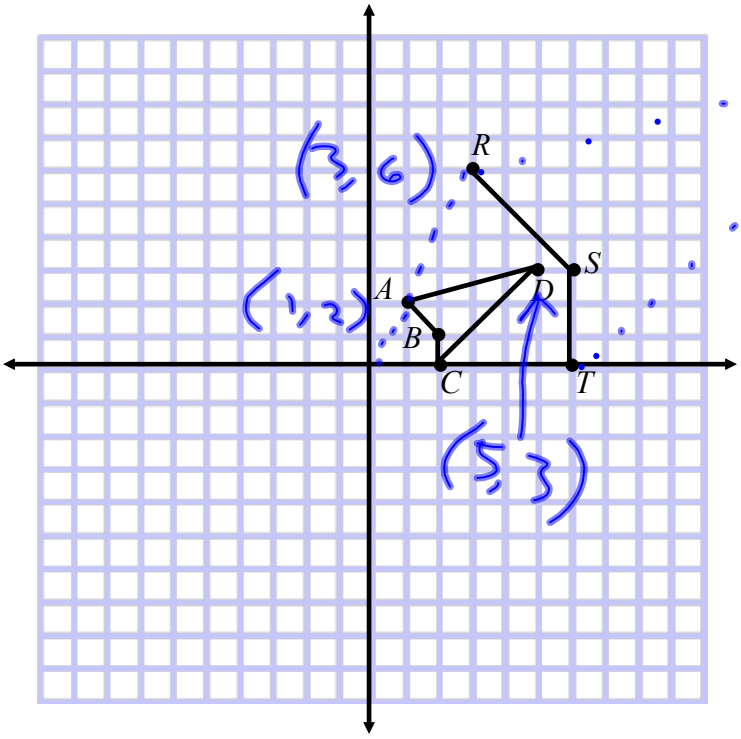
Verify that the triangles are similar.



AA
SSS
SAS

$\frac{3}{4} = \frac{6}{8}$

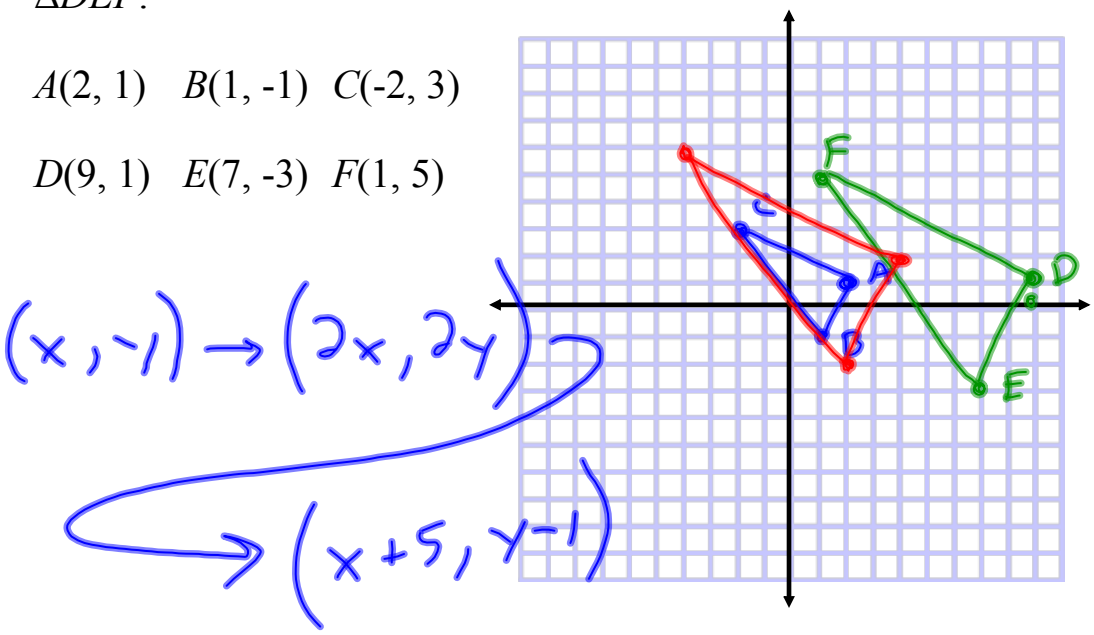
Ex 5 You want to draw quadrilateral $RSTU$ that is similar to quadrilateral $ABCD$. What are the coordinates of U?



Ex. 6 Describe two transformations that will transform ΔABC into ΔDEF.

$A(2, 1)$ $B(1, -1)$ $C(-2, 3)$

$D(9, 1)$ $E(7, -3)$ $F(1, 5)$



$(x, -1) \rightarrow (2x, 2y)$

$\rightarrow (x+5, y-1)$