

See answers below.....

1. Use the translation  $(x, y) \rightarrow (x + 1, y - 7)$  for questions a – d.

a. What is the translation vector?  $\langle 1, -7 \rangle$

b. What is the image of A (10, -4)?  $A'(11, -11)$

c. What is the image of A' from part b (which would be called A'')?  $A''(12, -18)$

d. What is the pre-image of C' (-9, 12)?  $C(-10, 19)$

2. What is an isometry? A transformation that preserves congruence.  
(same shape and same size)

3. The vertices of  $\triangle ABC$  are  $A(-1, 0)$ ,  $B(5, 3)$ , and  $C(2, -4)$ . Find the vertices of  $\triangle A'B'C'$  given the transformation rules below. Then describe the transformation that occurred.

a.  $(x, y) \rightarrow (x + 11, y - 5)$   $A' = (10, -5)$ ,  $B' = (16, -2)$ ,  $C' = (13, -9)$

Transformation: Translation  $\langle 11, -5 \rangle$

b.  $(x, y) \rightarrow (-x, -y)$   $A' = (1, 0)$ ,  $B' = (-5, -3)$ ,  $C' = (-2, 4)$

Transformation: Rotation  $180^\circ$

c.  $(x, y) \rightarrow (y, -x)$   $A' = (0, 1)$ ,  $B' = (3, -5)$ ,  $C' = (-4, -2)$

Transformation: Rotation  $90^\circ$  cw

d.  $(x, y) \rightarrow (4x, 4y)$   $A' = (-4, 0)$ ,  $B' = (20, 12)$ ,  $C' = (8, -16)$

Transformation: Dilation by a scale factor of 4

e.  $(x, y) \rightarrow (y, x)$   $A' = (0, -1)$ ,  $B' = (3, 5)$ ,  $C' = (-4, 2)$

Transformation: Reflection over  $y = x$

f.  $(x, y) \rightarrow (-y, x)$   $A' = (0, -1)$ ,  $B' = (-3, 5)$ ,  $C' = (4, 2)$

Transformation: Rotation  $90^\circ$  ccw

4. Answer the following questions.

a. After a reflection over the line  $y = x$ ,  $(-2, 16)$  is the image of point C. What is the original location of point C?

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

$C(16, -2)$

b. After a reflection over the x-axis,  $(8, 0)$  is the image of point M. What is the original location of point M?

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

$M(8, 0)$

\* Point does not change because it is on the x-axis (line of reflection).

c. Given triangle FUN with coordinates  $F(-4, 1)$ ,  $U(11, -12)$  and  $N(-7, -9)$ , find the image of point N after a rotation of 90 degrees counterclockwise.

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

$N'(9, -7)$

d. After a dilation with a scale factor of  $\frac{1}{2}$ ,  $(5, -4)$  is the **image** of point N. What is the original location of point N?

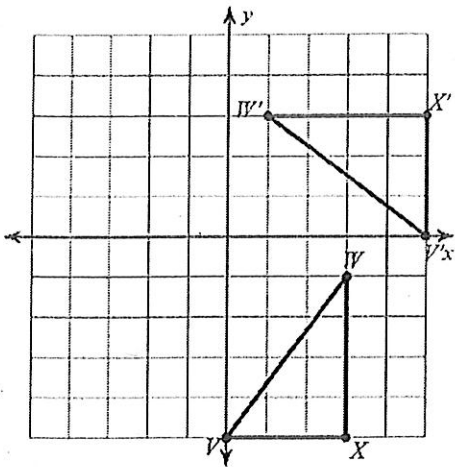
$\rightarrow$  new image

\* Multiply by 2 to get original image.

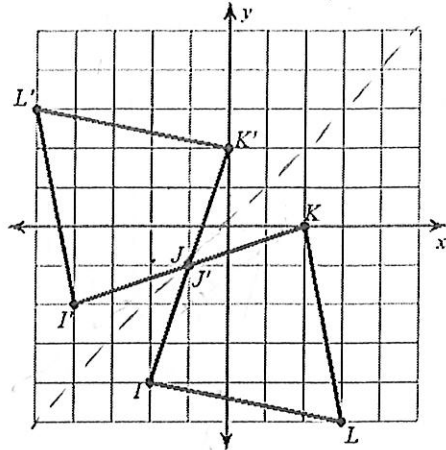
$N(10, -8)$

5. Write the transformation rule for the following graphs.

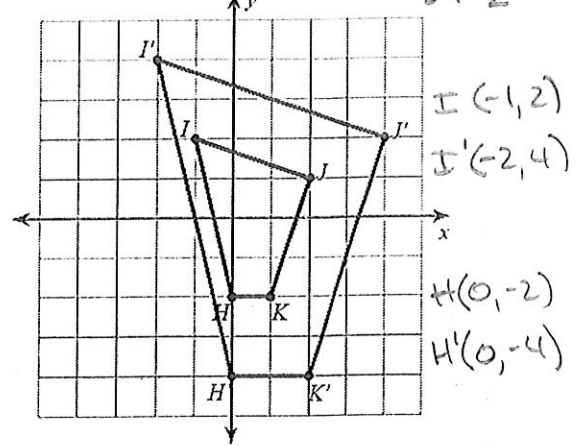
a. Rotation 90° CCW



b. Reflection  $y=x$

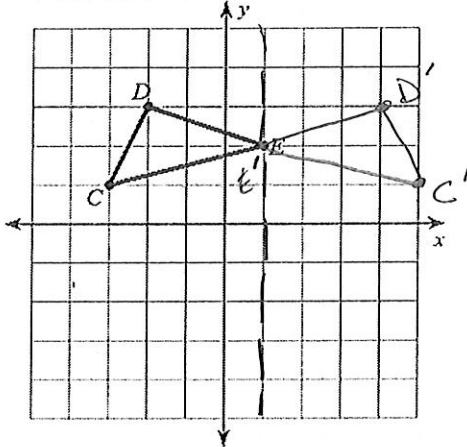


c. Dilation with a scale factor of 2

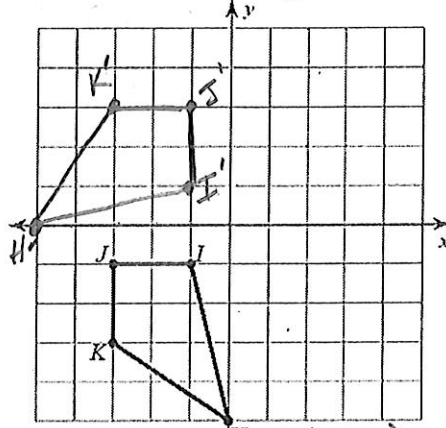


Follow the instructions for each graph.

6. Reflection over  $x=1$

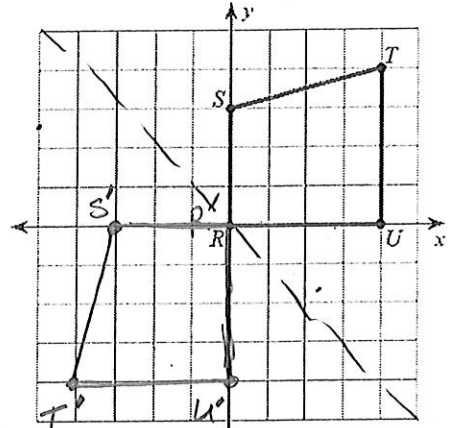


7. Rotation 90 degrees CW



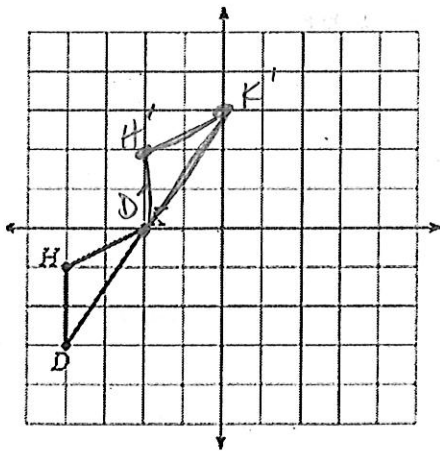
$H(0, -5)$      $H'(-5, 0)$   
 $I(-1, -1)$      $I'(-1, 1)$   
 $J(-3, -1)$      $J'(-1, 3)$   
 $K(-3, -3)$      $K'(-3, 3)$

8. Reflection over  $y=-x$

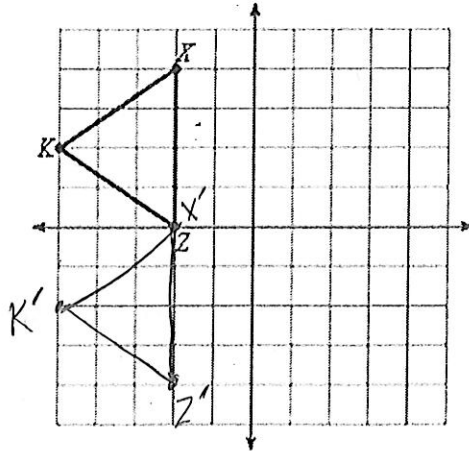


$S(0, 3)$      $S'(-3, 0)$   
 $T(4, 4)$      $T'(-4, -4)$   
 $U(4, 0)$      $U'(0, -4)$

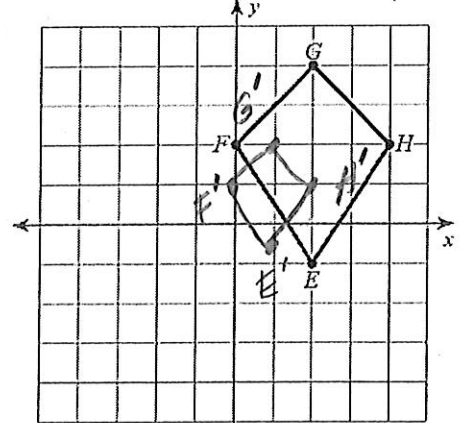
9.  $\langle 2, 3 \rangle$



10.  $(x, y) \rightarrow (x, y - 4)$



11.  $(x, y) \rightarrow (0.5x, 0.5y)$

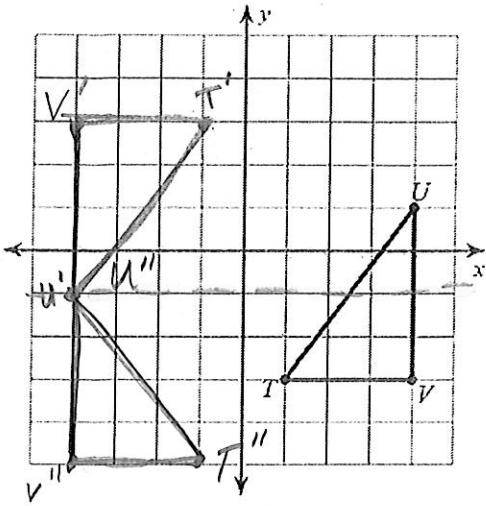


$E(2, -1)$      $E'(1, -.5)$   
 $F(0, 2)$      $F'(0, 1)$   
 $G(2, 4)$      $G'(1, 2)$   
 $H(4, 2)$      $H'(2, 1)$

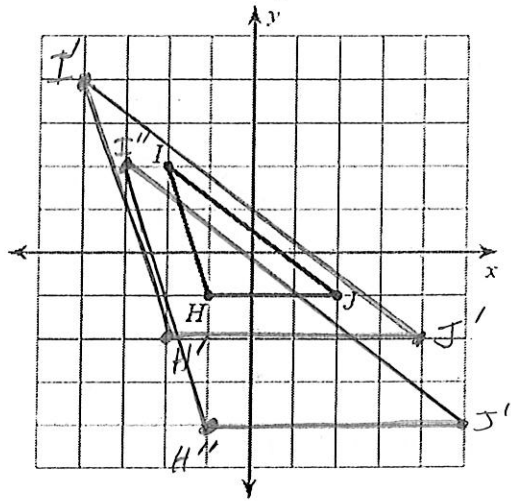
## Composition of Transformations

(Label the first transformation with  $\Delta A'B'C'$ . After the second transformation, label it with  $\Delta A''B''C''$ .)

12. a. rotation 180 degrees  $(x, y) \rightarrow (-x, -y)$   
 b. reflection over  $y = -1$
13. a. dilation of 2  
 b.  $\langle 1, -2 \rangle$  right 1, down 2



$V' (-4, 3)$	$V'' (-4, -5)$
$U' (-4, -1)$	$U'' (-4, -1)$
$T' (-1, 3)$	$T'' (-1, -5)$



H (-2, -1)  
 I (-2, 2)  
 J (2, -1)

$H' (-2, -2)$	$H'' (-1, -4)$
$I' (-4, 4)$	$I'' (-3, 2)$
$J' (4, -2)$	$J'' (5, -4)$

**GOOD LUCK STUDYING!!!! Don't forget to study your notes, your quiz, and this test review!!!**