

Translation: \_\_\_\_\_Reflection: \_\_\_\_\_Rotation: \_\_\_\_\_Dilation: \_\_\_\_\_

When doing all transformations we always start with the pre-image points \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ . . . and then we plot the image points \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ . . . (We call \_\_\_\_\_ - \_\_\_\_\_)

When a pre-image is \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ it is congruent to the image.

\*\*\* \_\_\_\_\_ do not produce congruent images.

Describe the following Transformations:

$(x,y) \rightarrow (x+6, y-4)$  \_\_\_\_\_ CONGRUENT or NOT CONGRUENT

$(x,y) \rightarrow (x-2, y+1)$  \_\_\_\_\_ CONGRUENT or NOT CONGRUENT

$(x,y) \rightarrow (2x, 2y)$  \_\_\_\_\_ CONGRUENT or NOT CONGRUENT

$(x,y) \rightarrow (x+7, y+6)$  \_\_\_\_\_ CONGRUENT or NOT CONGRUENT

$(x,y) \rightarrow (x-8, y-9)$  \_\_\_\_\_ CONGRUENT or NOT CONGRUENT

$(x,y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$  \_\_\_\_\_ CONGRUENT or NOT CONGRUENT

If we want to undo a transformation, we want to do the \_\_\_\_\_ operations!

Undo the following Transformations:

$(x,y) \rightarrow (x+6, y-4)$  to undo . . .  $(x,y) \rightarrow$  ( \_\_\_\_\_ , \_\_\_\_\_ )

$(x,y) \rightarrow (x-2, y+1)$  to undo . . .  $(x,y) \rightarrow$  ( \_\_\_\_\_ , \_\_\_\_\_ )

$(x,y) \rightarrow (2x, 2y)$  to undo . . .  $(x,y) \rightarrow$  ( \_\_\_\_\_ , \_\_\_\_\_ )

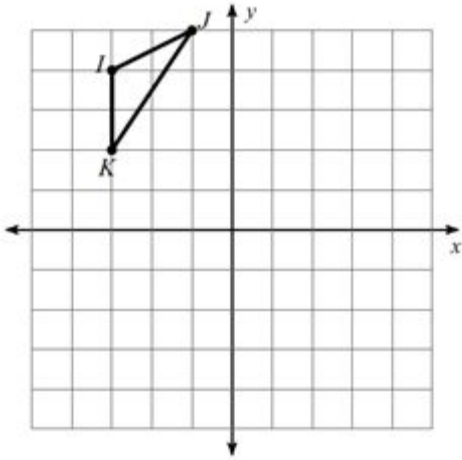
$(x,y) \rightarrow (x+7, y+6)$  to undo . . .  $(x,y) \rightarrow$  ( \_\_\_\_\_ , \_\_\_\_\_ )

$(x,y) \rightarrow (x-8, y-9)$  to undo . . .  $(x,y) \rightarrow$  ( \_\_\_\_\_ , \_\_\_\_\_ )

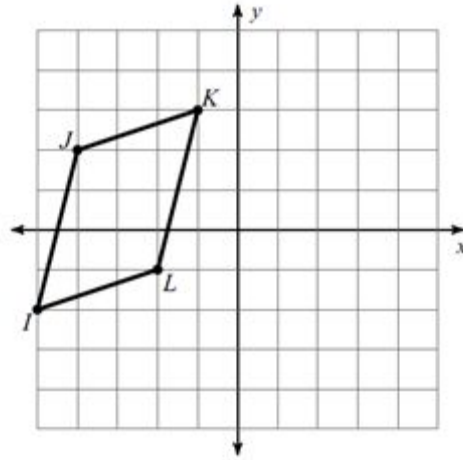
$(x,y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$  to undo . . .  $(x,y) \rightarrow$  ( \_\_\_\_\_ , \_\_\_\_\_ )

**Graph the image of the figure using the transformation given.**

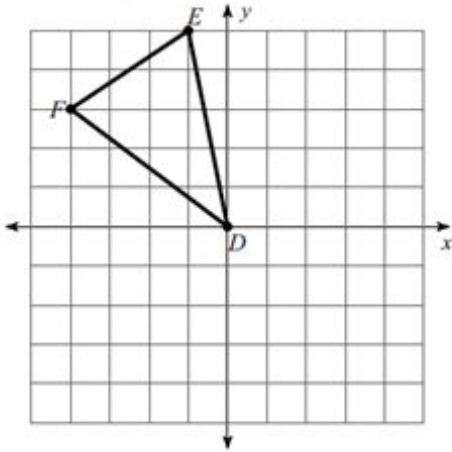
1) translation:  $(x, y) \rightarrow (x, y - 2)$



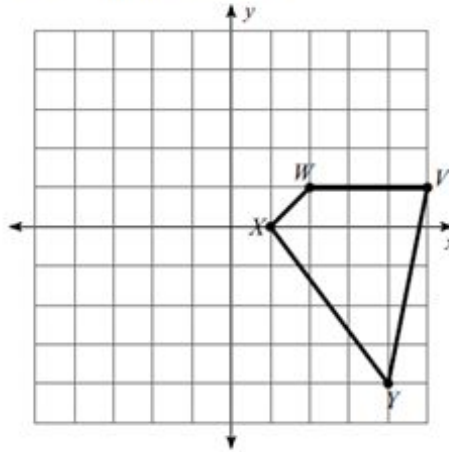
2) translation:  $(x, y) \rightarrow (x + 3, y)$



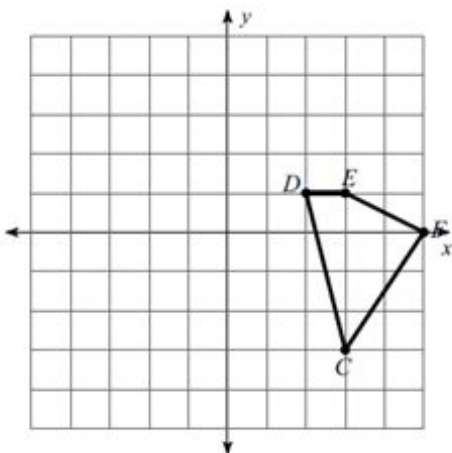
3) translation:  $(x, y) \rightarrow (x + 1, y - 3)$



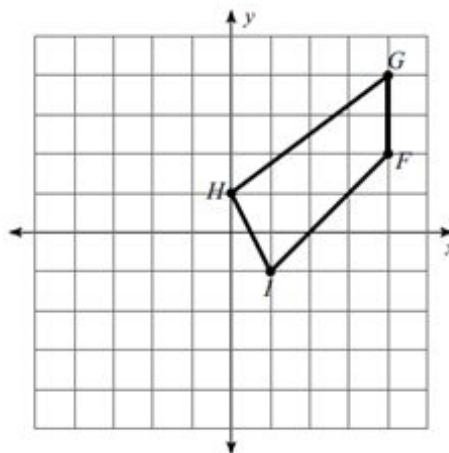
4) translation:  $(x, y) \rightarrow (x - 1, y + 1)$



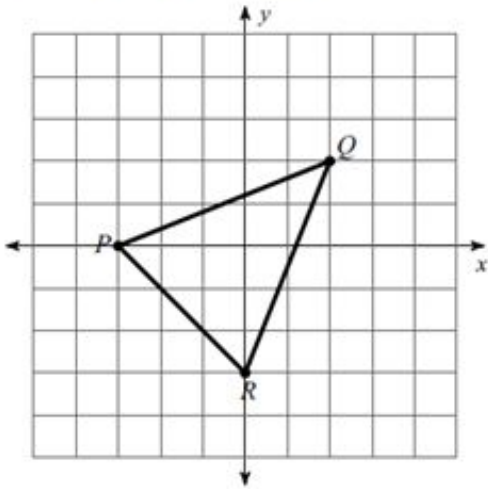
5) reflection across the x-axis



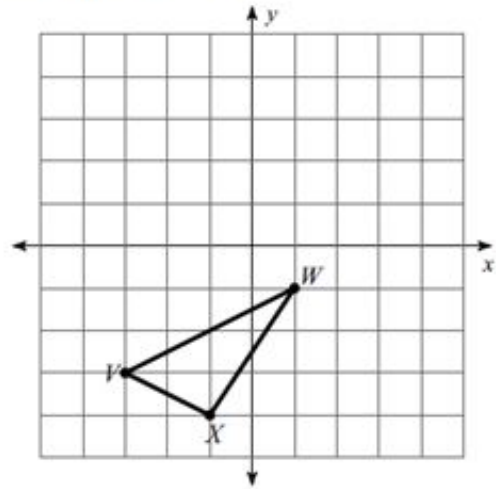
6) reflection across the y-axis



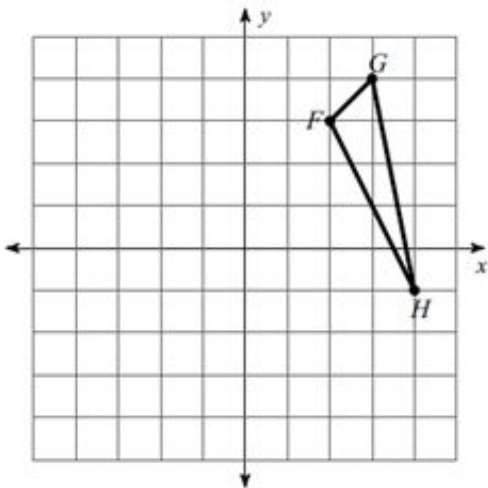
7) reflection across  $y = 1$



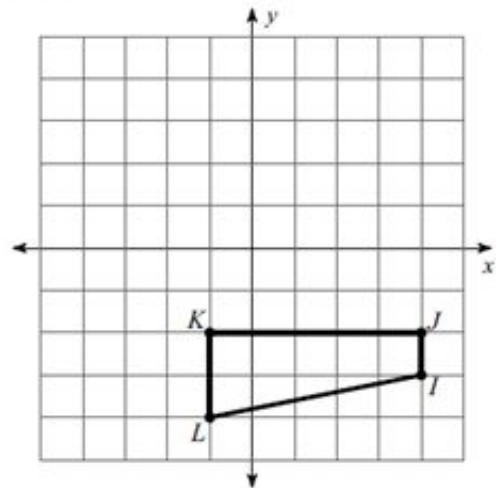
8) reflection across  $x = -1$



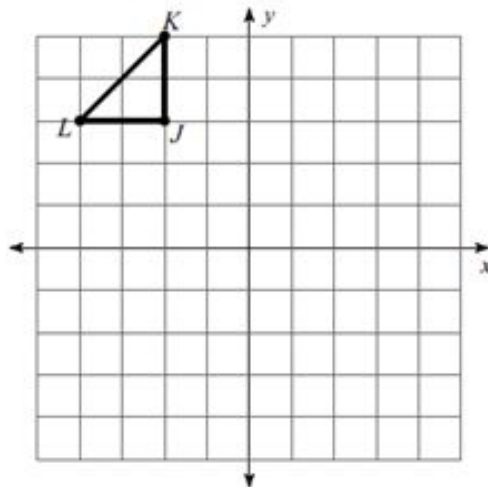
9) reflection across  $y = x$



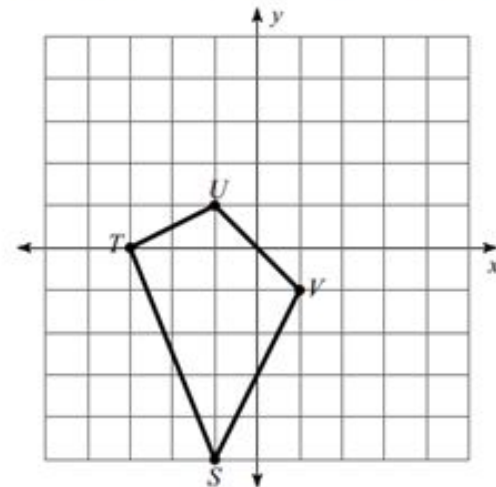
10) reflection across  $y = -x$



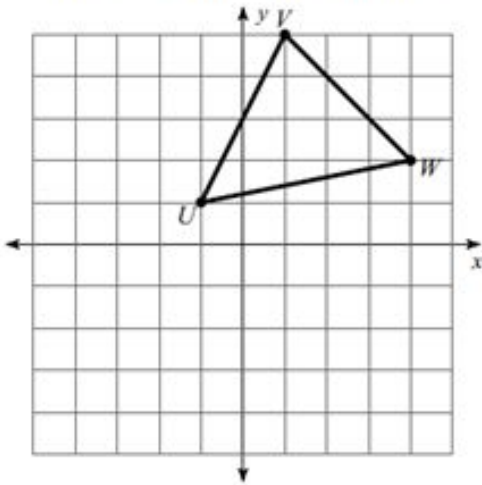
11) rotation  $90^\circ$  clockwise about the origin



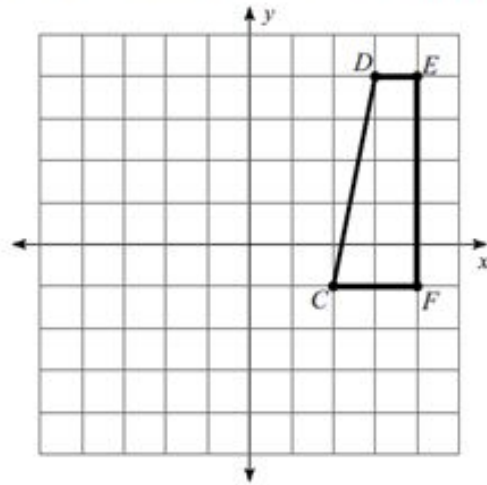
12) rotation  $90^\circ$  clockwise about the origin



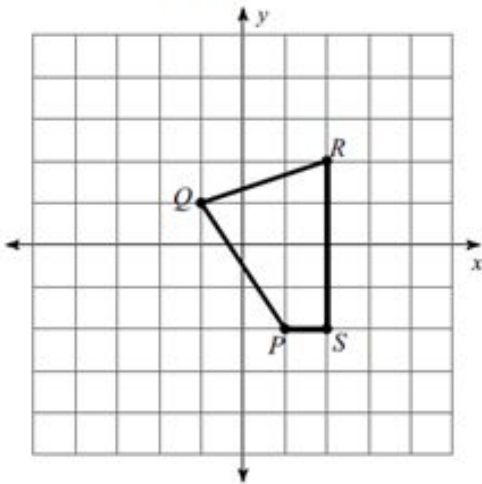
13) rotation  $180^\circ$  about the origin



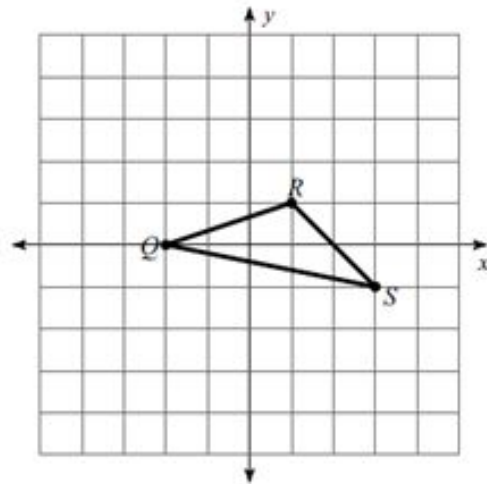
14) rotation  $90^\circ$  clockwise about the origin



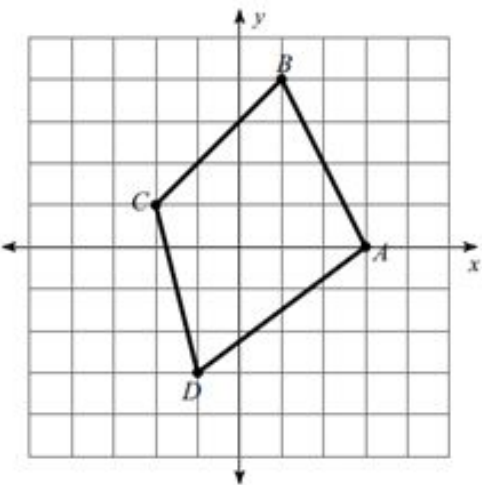
15) dilation of 2 about the origin



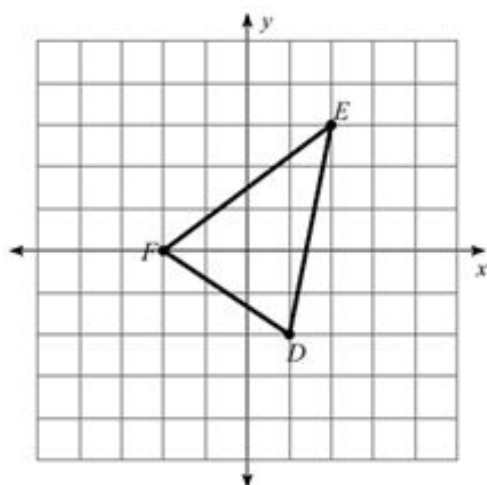
16) dilation of 1.5 about the origin



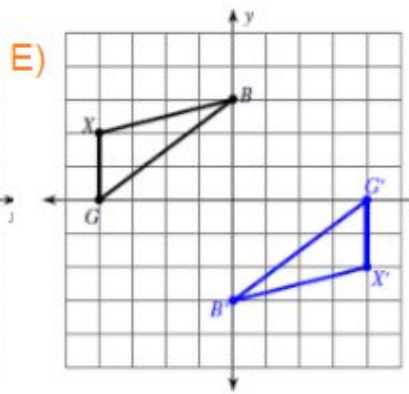
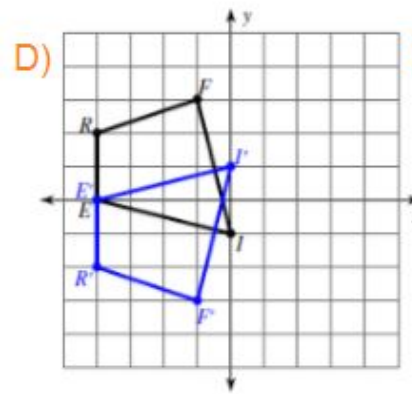
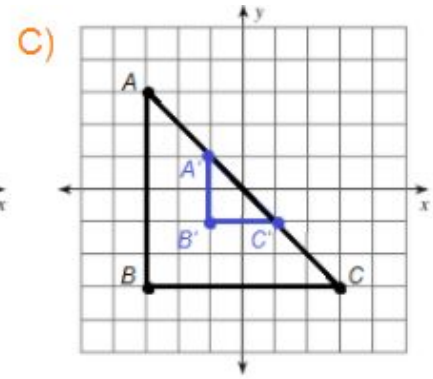
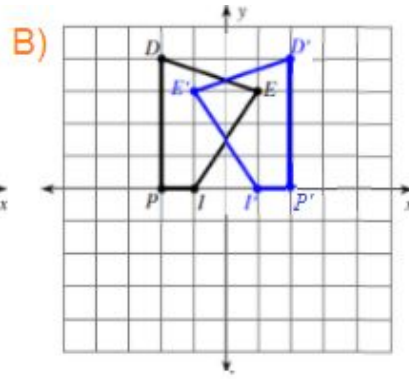
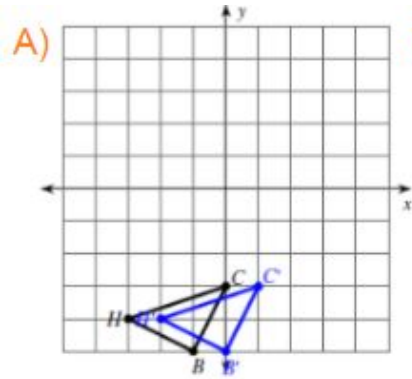
17) dilation of 0.25 about the origin



18) dilation of  $\frac{1}{2}$  about the origin



19) Label each type of transformation below. Be specific! State directions, degrees (rotations), and lines of reflections.




What is Rotational Symmetry: \_\_\_\_\_

Smallest Angle of Rotational Symmetry = \_\_\_\_\_

What is a Line of Symmetry: \_\_\_\_\_

Find the smallest angle of rotational symmetry, additional angles and lines of symmetry for the following figures: Draw them in!

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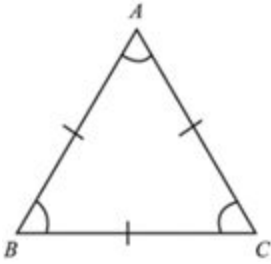
Shape Name: \_\_\_\_\_

Smallest Angle: \_\_\_\_\_

Other Angles: \_\_\_\_\_

Lines of Symmetry: \_\_\_\_\_

2.



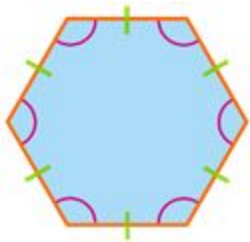
Shape Name: \_\_\_\_\_

Smallest Angle: \_\_\_\_\_

Other Angles: \_\_\_\_\_

Lines of Symmetry: \_\_\_\_\_

3.



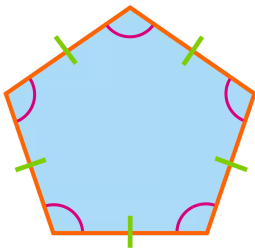
Shape Name: \_\_\_\_\_

Smallest Angle: \_\_\_\_\_

Other Angles: \_\_\_\_\_

Lines of Symmetry: \_\_\_\_\_

4.



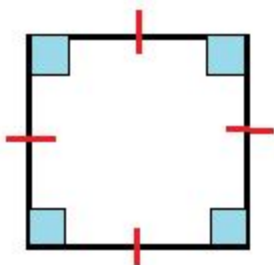
Shape Name: \_\_\_\_\_

Smallest Angle: \_\_\_\_\_

Other Angles: \_\_\_\_\_

Lines of Symmetry: \_\_\_\_\_

5.



Shape Name: \_\_\_\_\_

Smallest Angle: \_\_\_\_\_

Other Angles: \_\_\_\_\_

Lines of Symmetry: \_\_\_\_\_