Complete the chart with the work and final coordinates of the image for each step of the composition. Sketch the initial figure and final image on the graph provided. Label both figures.

1. Pre-image: H(4,4), I(-2,2), J(-2,-2), K(2,-2)

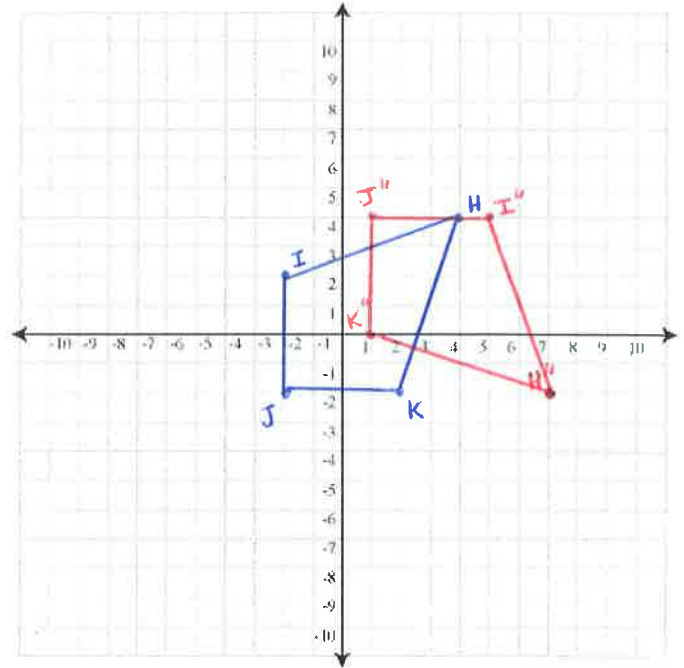| |
|---|
| Rotate the figure 90° **clockwise** about the origin. $(y, -x)$ |
| $H(4,4) \rightarrow H'(4,-4)$ |
| $I(-2,2) \rightarrow I'(2,2)$ |
| $J(-2,-2) \rightarrow J'(-2,2)$ |
| $K(2,-2) \rightarrow K'(-2,-2)$ |
| Translate the figure according to $(x,y) \rightarrow (x+3, y+2)$ |
| $H'(4,-4) \rightarrow H''(7,-2)$ |
| $I'(2,2) \rightarrow I''(5,4)$ |
| $J'(-2,2) \rightarrow J''(1,4)$ |
| $K'(-2,-2) \rightarrow K''(1,0)$ |

2. Pre-image: D(-10,6), E(-2,6), F(-4,9), G(-8,9)

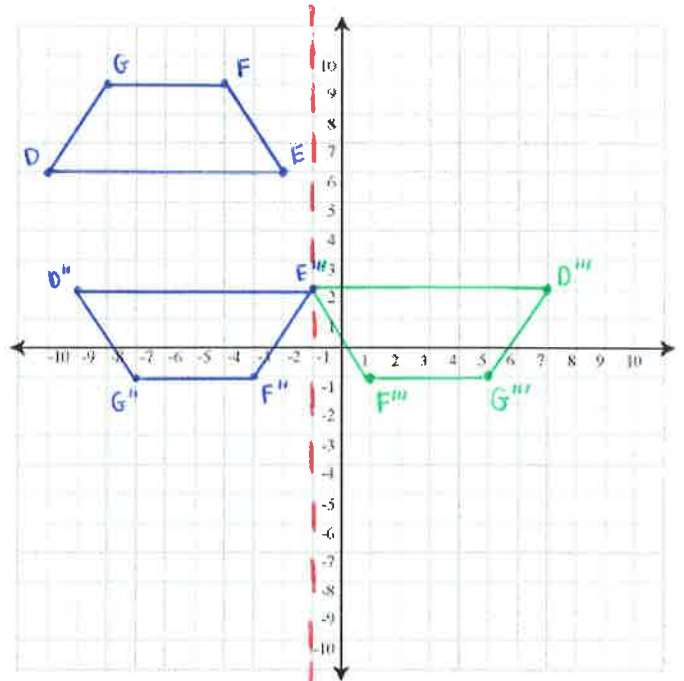| |
|---|
| Translate the figure according to $(x,y) \rightarrow (x+1, y-8)$ |
| $D(-10,6) \rightarrow D'(-9,-2)$ |
| $E(-2,6) \rightarrow E'(-1,-2)$ |
| $F(-4,9) \rightarrow F'(-3,1)$ |
| $G(-8,9) \rightarrow G'(-7,1)$ |
| Reflect the figure over the x-axis $(x,-y)$ |
| $D'(-9,-2) \rightarrow D''(-9,2)$ |
| $E'(-1,-2) \rightarrow E''(-1,2)$ |
| $F'(-3,1) \rightarrow F''(-3,-1)$ |
| $G'(-7,1) \rightarrow G''(-7,-1)$ |
| Reflect the figure over the line x = -1 |
| $D'''(7,2)$ |
| $E'''(-1,2)$ |
| $F'''(1,-1)$ |
| $G'''(5,-1)$ |

3. Pre-image: L(7,2), M(0,9), N(-6,-5)

Reflect the figure over the y-axis $(x,y) \to (-x,y)$

$L(7,2) \to L'(-7,2)$

$M(0,9) \to M'(0,9)$

$N(-6,-5) \to N'(6,-5)$

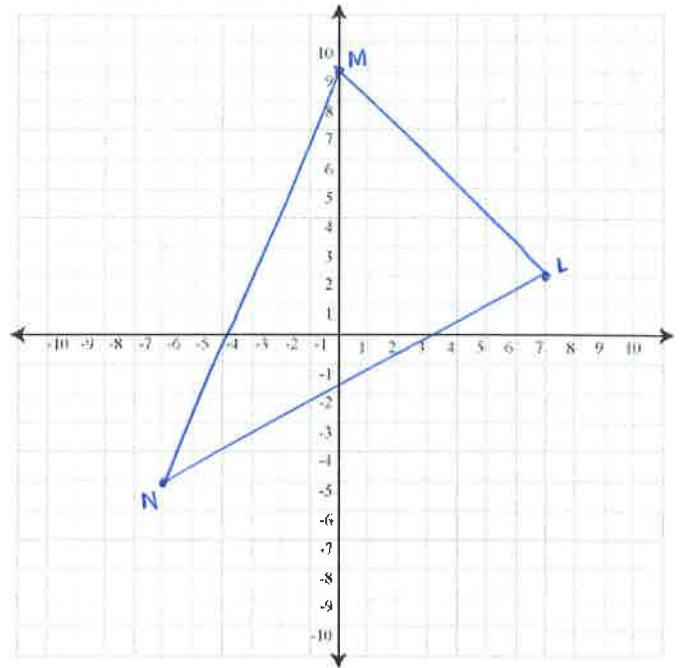Rotate the figure 180° about the origin $(x,y) \to (-x,-y)$

$L'(-7,2) \to L''(7,-2)$

$M'(0,9) \to M''(0,-9)$

$N'(6,-5) \to N''(-6,5)$

Translate the figure according to $(x,y) \to (x-5, y-2)$

$L''(7,-2) \to L'''(2,-4)$

$M''(0,-9) \to M'''(-5,-11)$

$N''(-6,5) \to N'''(-11,3)$

4. Pre-image: A(0,0), B(8,1), C(5,5)

Rotate the figure 270° about the origin. $(x,y) \to (y,-x)$

$A(0,0) \to A'(0,0)$

$B(8,1) \to B'(1,-8)$

$C(5,5) \to C'(5,-5)$

Reflect the figure over the line y = x $(x,y) \to (y,x)$

$A'(0,0) \to A''(0,0)$

$B'(1,-8) \to B''(-8,1)$

$C'(5,-5) \to C''(-5,5)$

Translate the figure according to $(x,y) \to (x+6, y-1)$
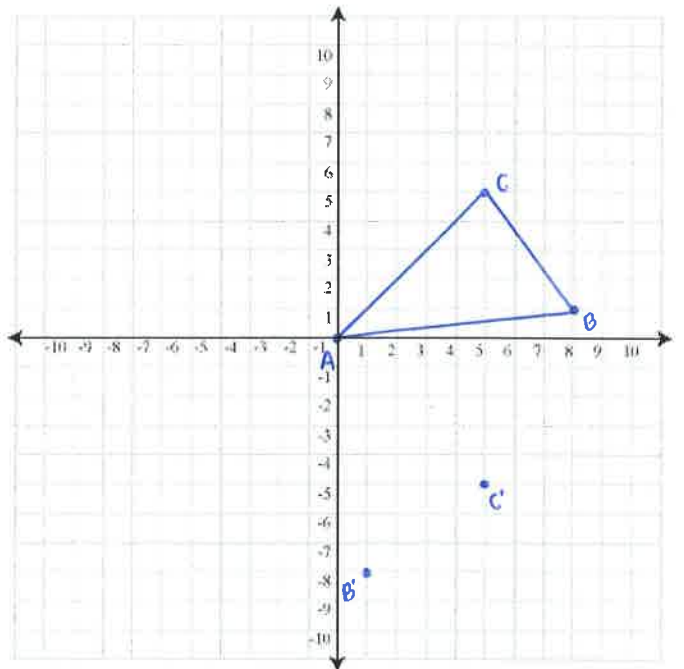
$A''(0,0) \to A'''(6,-1)$

$B''(-8,1) \to B'''(-2,0)$

$C''(-5,5) \to C'''(1,4)$

Reflect over the x-axis $(x,y) \to (x,-y)$

$A'''(6,-1) \to A''''(6,1)$

$B'''(-2,0) \to B''''(-2,0)$

$C'''(1,4) \to C''''(1,-4)$

5. Pre-image: A(-1,3) , B(-4,6) , C(-3,-3)

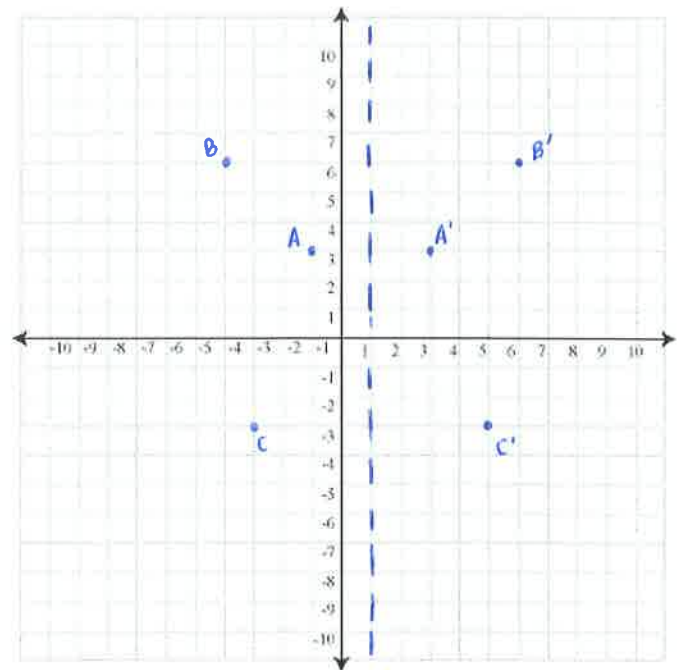| |
|---|
| Reflect the figure over the line x = 1 |
| $A(-1,3) \rightarrow A'(3,3)$ |
| $B(-4,6) \rightarrow B'(6,6)$ |
| $C(-3,-3) \rightarrow C'(5,-3)$ |
| Translate the figure according to (x,y) →(x+2 , y+1) |
| $A'(3,3) \rightarrow A''(5,4)$ |
| $B'(6,6) \rightarrow B''(8,7)$ |
| $C'(5,-3) \rightarrow C''(7,-2)$ |
| **(-y,x)** Rotate the figure 90° about the point (-2 , 0) → (0,0) x+2 |
| $A''(5,4) \rightarrow (7,4) \rightarrow (-4,7) \rightarrow A'''(-6,7)$ |
| $B''(8,7) \rightarrow (10,7) \rightarrow (-7,10) \rightarrow B'''(-9,10)$ |
| $C''(7,-2) \rightarrow (9,-2) \rightarrow (2,9) \rightarrow C'''(0,9)$ |
| Reflect over the y-axis $(x,y) \rightarrow (-x,y)$ |
| $A'''(-6,7) \rightarrow A''''(6,7)$ |
| $B'''(-9,10) \rightarrow B''''(9,10)$ |
| $C'''(0,9) \rightarrow C''''(0,9)$ |

6. Pre-image A(-3,2) , B(-5, -4)

$\nearrow (x,y) \rightarrow (y,-x)$
Rotate the figure 270° counterclockwise about the origin
$A(-3,2) \rightarrow A'(2,3)$
$B(-5,-4) \rightarrow B'(-4,5)$
(-y,x) Rotate the figure 90° about the point (3,0) $(x,y) \rightarrow (-y,x)$
$A'(2,3) \rightarrow (-1,3) \rightarrow (-3,-1) \rightarrow (0,-1) A''$ $\searrow (0,0)$ x-3
$B'(-4,5) \rightarrow (-7,5) \rightarrow (-5,-7) \rightarrow (-2,-7) B''$
Reflect over the line y = -x $(x,y) \rightarrow (-y,-x)$
$A''(0,-1) \rightarrow A'''(1,0)$
$B''(-2,-7) \rightarrow B'''(7,2)$