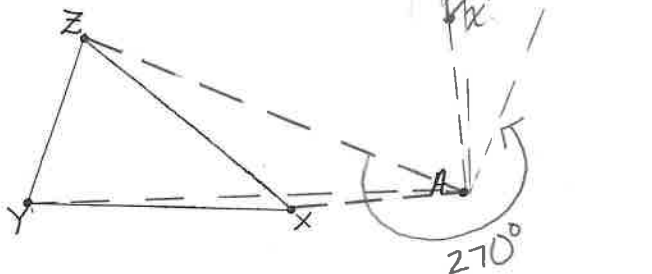
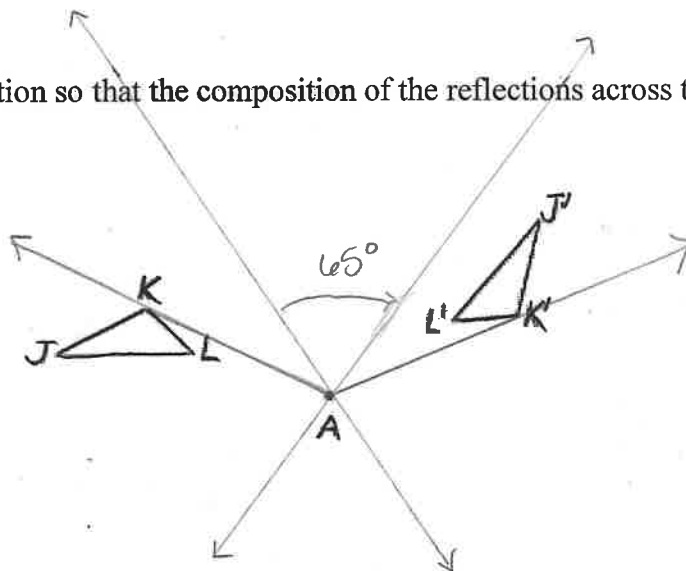


Exercises 1–3, perform each transformation.

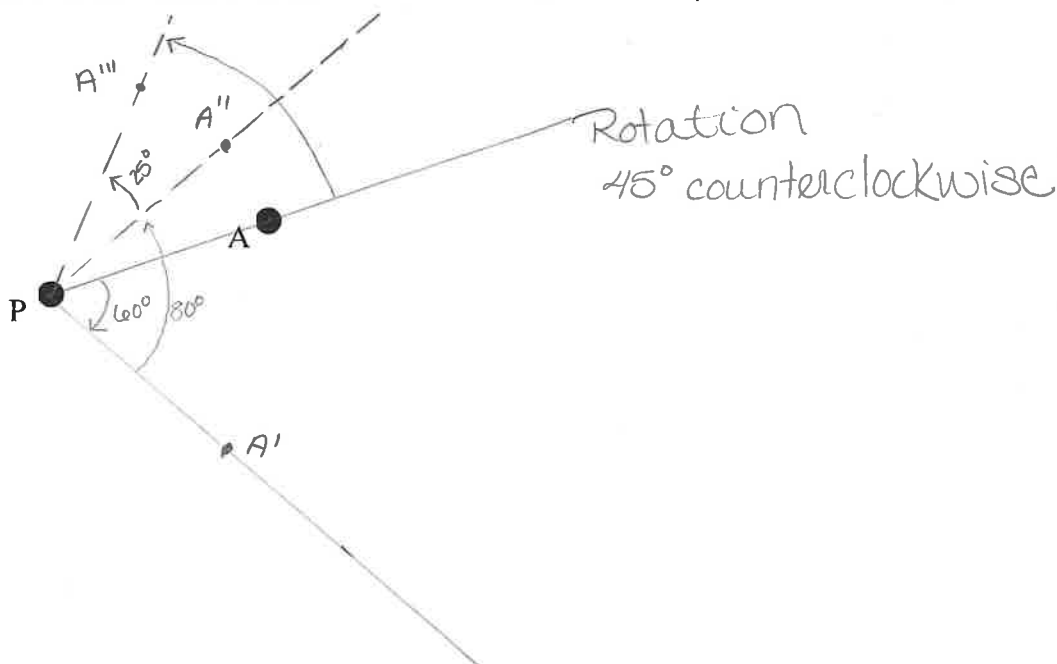
1.) Draw the rotated image $R_{(270^\circ, A)}(\triangle XYZ)$



2.) Draw two lines of reflection so that the composition of the reflections across the lines maps onto the image show.

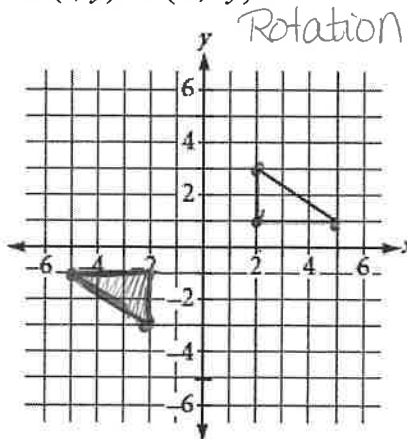


3.) Rotation point A 60° clockwise, followed by 80° counterclockwise, followed by 25° counterclockwise all about point P as the center of rotation. State the single transformation from the original to the final image.

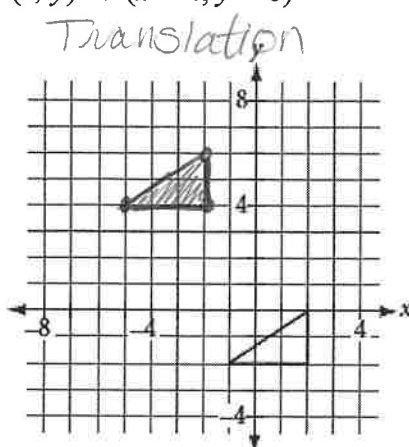


In Exercises 4-6, draw the image according to the rule and identify the type of transformation.

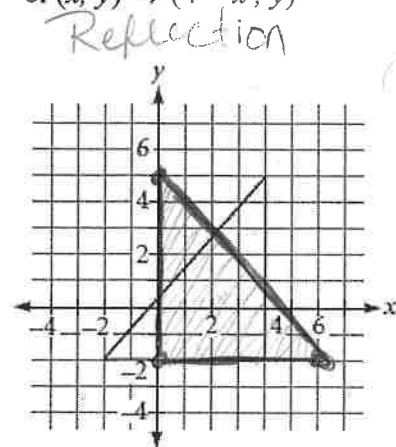
4. $(x, y) \rightarrow (-x, -y)$



5. $(x, y) \rightarrow (x - 4, y + 6)$

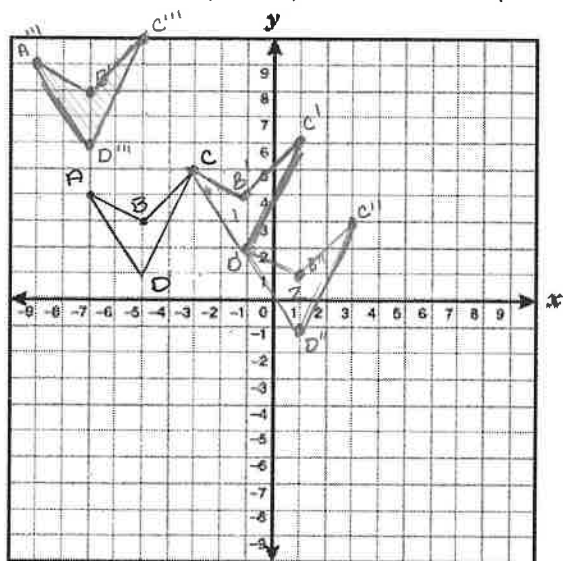


6. $(x, y) \rightarrow (4 - x, y)$



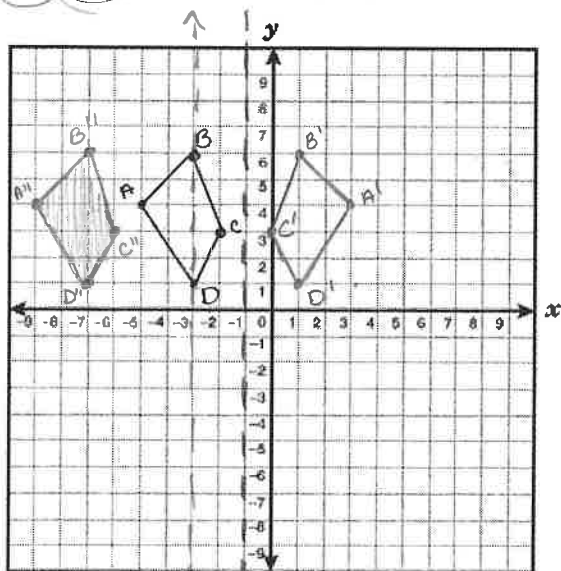
For exercises 7-11, graph the following transformations. Then write the transformation as a single translation.

7.) Translation by $\langle +4, +1 \rangle$, followed by $\langle +2, -3 \rangle$, followed by $\langle -8, +7 \rangle$



Single Transformation $T_{\langle -2, 5 \rangle}$

8.) $R_n \circ R_m$ where line n is $x = -3$ and line m is $x = -1$.

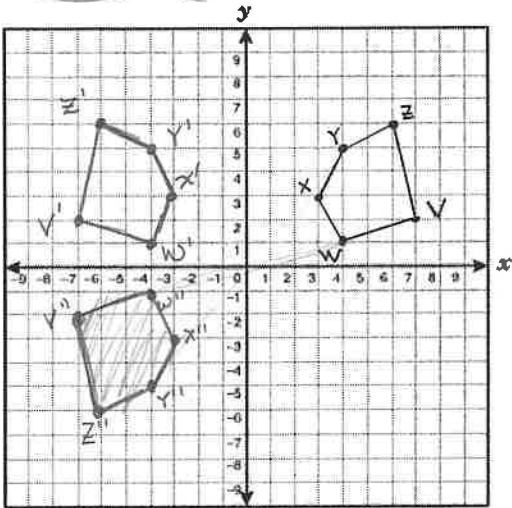


Single Transformation $T_{\langle -4, 0 \rangle}$

$x = -3$
 $x = -1$

9.)

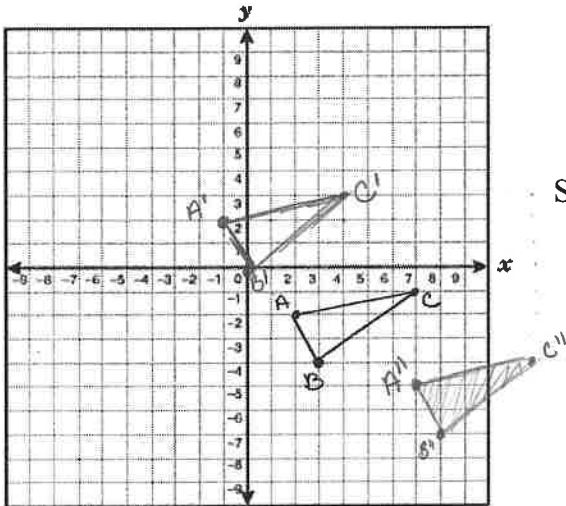
$R_{(x\text{-axis})} \circ R_{(y\text{-axis})}$



Single Transformation

$R_{(180^\circ, 0)}$

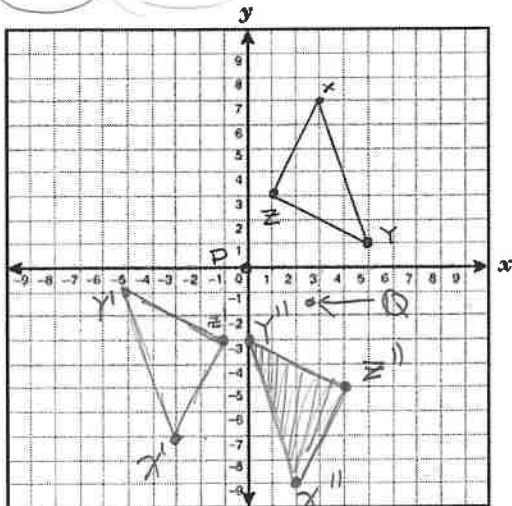
10.) $T_{\langle 3, 4 \rangle} \circ T_{\langle 8, -7 \rangle}$



Single Transformation

$T_{\langle 5, -3 \rangle}$

11.) $T_{\langle 5, -2 \rangle} \circ R_{(180^\circ, P)}$

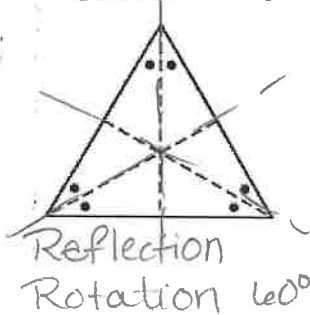


Single Transformation

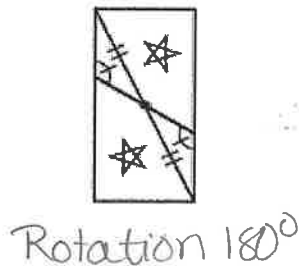
Rotation
 $R_{(180^\circ, P)}$

In Exercises 12-15, identify the type(s) of symmetry in each figure.

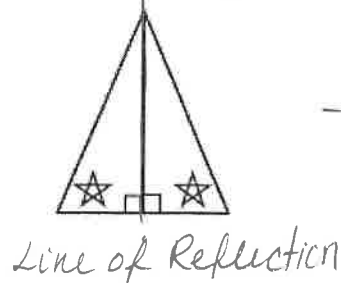
12.) Equilateral triangle



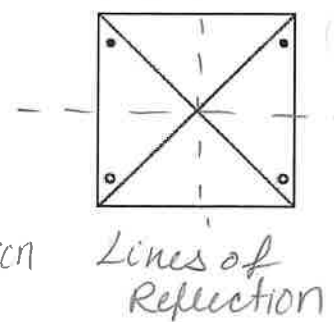
13.) Rectangle



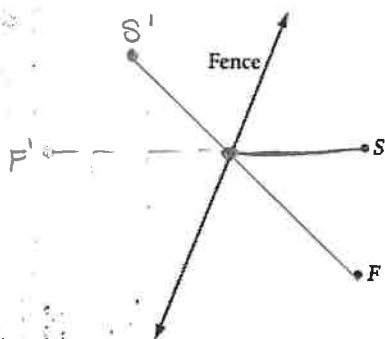
14.) Isosceles triangle



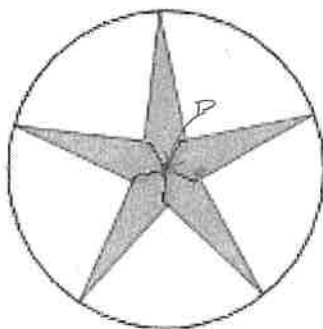
15.) Square



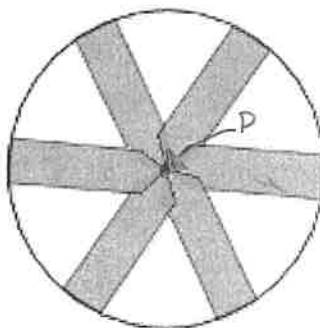
16.) The Harbor High Geometry Class is holding a Fence Race. Contestants must touch each fence at some point as they run from S to F . Use your geometry tools to draw the shortest possible race path.



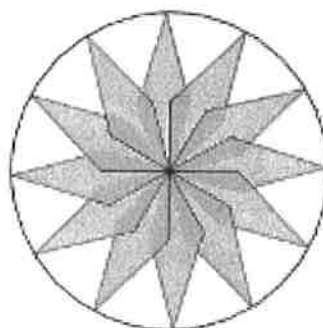
17.) Wheel rim designs are rotations. Write the rotation rule for each of the design sketches show. Assume the center of the circle is point P .



a. $r_{(72^\circ, P)}(x, y)$



b. $r_{(60^\circ, P)}(x, y)$



c. $r_{(30^\circ, P)}(x, y)$

18.) How many copies of the image are in the circle for $r_{(36^\circ, P)}(x, y)$?

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19.) How many copies of the image are in the circle for $r_{(40^\circ, P)}(x, y)$?

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