

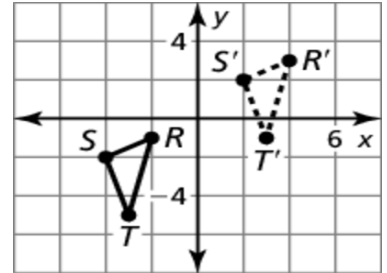
Translations, Reflections, and Rotations.

1. The vertices of $\triangle ABC$ are $A(2, 3)$, $B(-1, 2)$, and $C(0, 1)$. What are the new points if $\triangle ABC$ is translated using the vector $\langle 1, -4 \rangle$?

$A'(\quad , \quad) \quad B'(\quad , \quad) \quad C'(\quad , \quad)$

2. Find the component form of the vector that translates $A(3, -2)$ to $A'(-1, 4)$.

3. Write a rule for the translation of $\triangle RST$ to $\triangle R'S'T'$.



In Exercises 4-6, use the translation $(x, y) \rightarrow (x + 1, y - 3)$ to find;

4. The image of $Q(5, 9)$

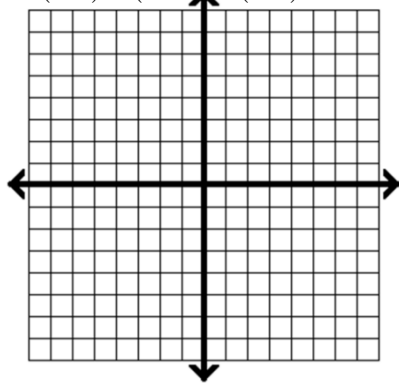
5. The preimage of $R'(0,7)$

6. The image of $M(-3, -8)$

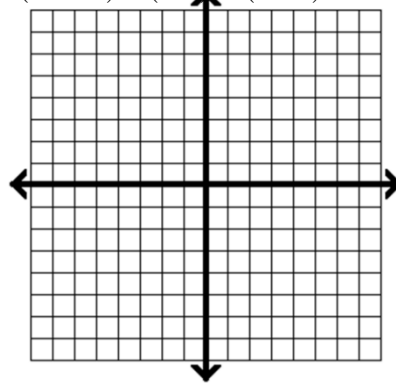
7. Point $P(4, -2)$ undergoes a translation given by $(x, y) \rightarrow (x + 3, y - a)$, followed by another translation $(x, y) \rightarrow (x - b, y + 7)$ to produce the image of $P''(-5, 8)$. Find the values of a and b and point P' .

In Exercises 8-10, $\triangle ABC$ is given. Find its image after a reflection in the given line.

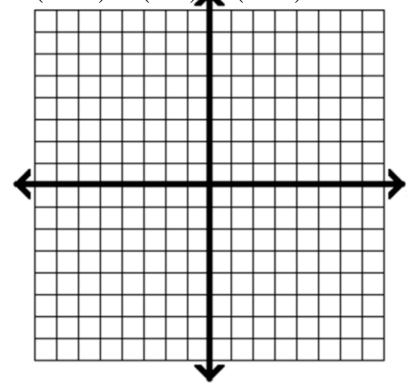
8. $A(0, 2)$, $B(1, -3)$, $C(2, 4)$; x -axis



9. $A(-2, -4)$, $B(6, 2)$, $C(3, -5)$; y -axis

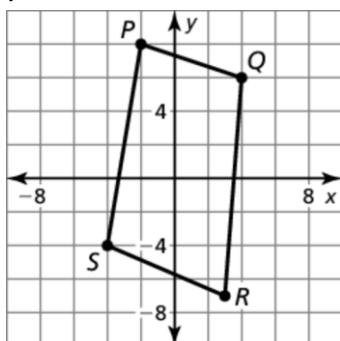


10. $A(4, -1)$, $B(3, 8)$, $C(-1, 1)$; $y = -2$

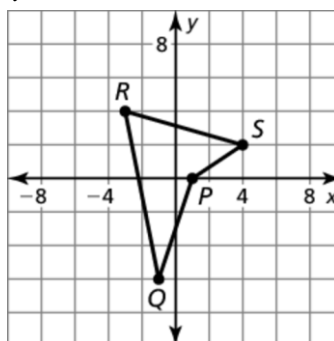


In Exercises 11 and 12, graph the image after a reflection in the given line.

11. $y = -x$

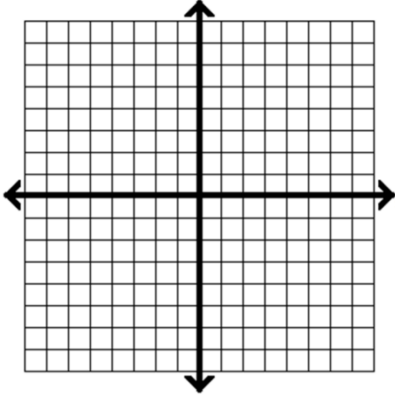


12. $y = x$

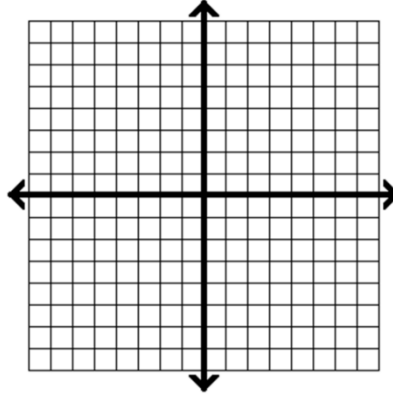


In Exercises 13 and 14, you are given $\triangle JKL$ with vertices $J(2, 3)$, $K(-2, 1)$, and $L(-1, 5)$. Find the final vertices after the composition below.

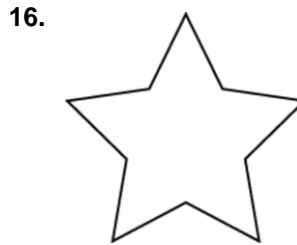
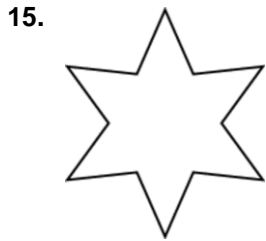
13. Translation: $(x, y) \rightarrow (x - 1, y)$
 Reflection: in the x -axis



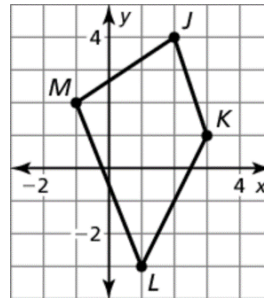
14. Translation: $(x, y) \rightarrow (x + 2, y - 3)$
 Reflection: in the line $x = -2$



Determine the number of lines of symmetry for the figure.

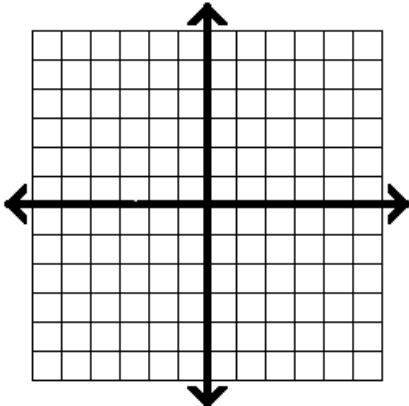


17. Graph the image after a 270° rotation about the origin.



In Exercises 18 and 19, graph $\triangle RST$ with vertices $R(2, 3)$, $S(-2, 1)$, and $T(-1, 5)$ and its image after the composition.

18. Translation: $(x, y) \rightarrow (x - 2, y - 1)$
 Rotation: 90° about the origin



19. Reflection: in the line $y = x$
 Rotation: 180° about the origin

