Date: 11/11/21

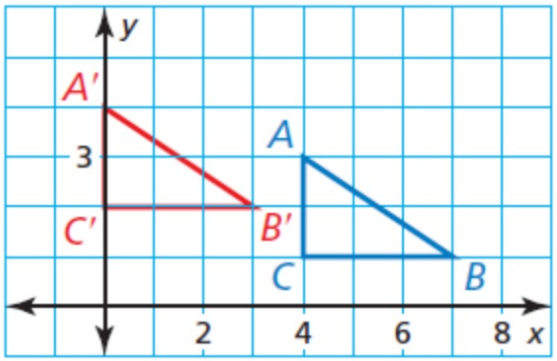
Lesson 4.1 and 4.2 Translations & Reflections

Learning Intent (Target): *Today I will* be able to graph points, line segments, and polygons in the coordinate plane using transformations. Write rules of transformations given graphs.

Success Criteria: *I'll know I'll have it when* I can accuratley use and write rules of translations, reflections, and rotations of points, line segments, and polygons in the coordinate plane.

Accountable Team Task: *Therefore, I can* practice using interactive flip charts and gizmos to graph transformations.

Write a rule for the translation of $\triangle ABC$ to $\triangle A'B'C'$.



Write a rule for the translation of $\triangle ABC$ to $\triangle A'B'C'$.

SOLUTION

To go from A to A', you move 4 units left and 1 unit up

▶ So, a rule for the translation is $(x, y) \rightarrow (x - 4, y + 1)$.

Graph $\overline{RS}$ with endpoints $R(-8, 5)$ and $S(-6, 8)$ and its image after the composition.

Translation $(x, y) \rightarrow (x + 5, y - 2)$

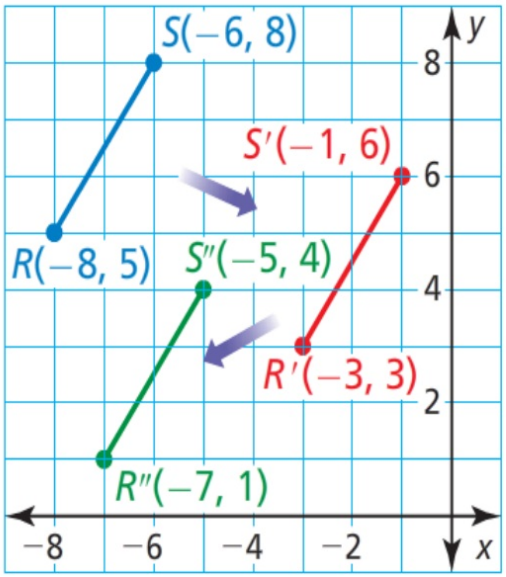
Translation $(x, y) \rightarrow (x - 4, y - 2)$

SOLUTION

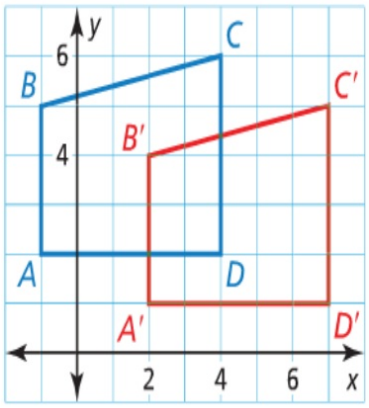
Step 1 Graph $\overline{RS}$.

Step 2 Translate $\overline{RS}$ 5 units right and 2 units down. $\overline{R'S'}$ has endpoints $R'(-3, 3)$ and $S'(-1, 6)$.

Step 3 Translate $\overline{R'S'}$ 4 units left and 2 units down. $\overline{R''S''}$ has endpoints $R''(-7, 1)$ and $S''(-5, 4)$.



Graph quadrilateral $ABCD$ with vertices $A(-1, 2)$, $B(-1, 5)$, $C(4, 6)$, and $D(4, 2)$ and its image after the translation $(x, y) \rightarrow (x + 3, y - 1)$.



SOLUTION

Graph quadrilateral $ABCD$. To find the coordinates of the vertices of the image, add 3 to the x-coordinates and subtract 1 from the y-coordinates of the vertices of the preimage. Then graph the image, as shown at the left.

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

$A(-1, 2) \rightarrow A'(2, 1)$

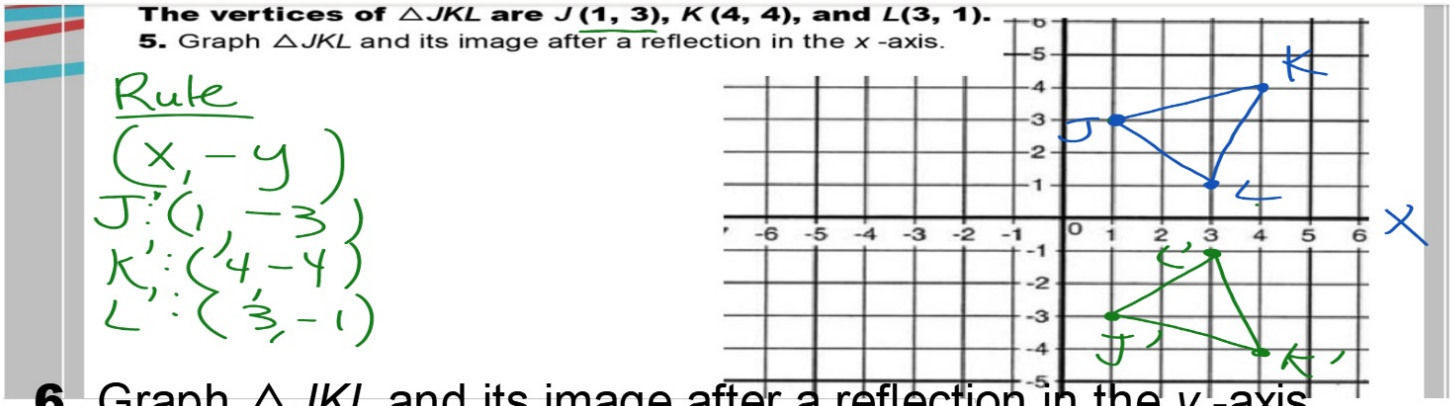
$B(-1, 5) \rightarrow B'(2, 4)$

$C(4, 6) \rightarrow C'(7, 5)$

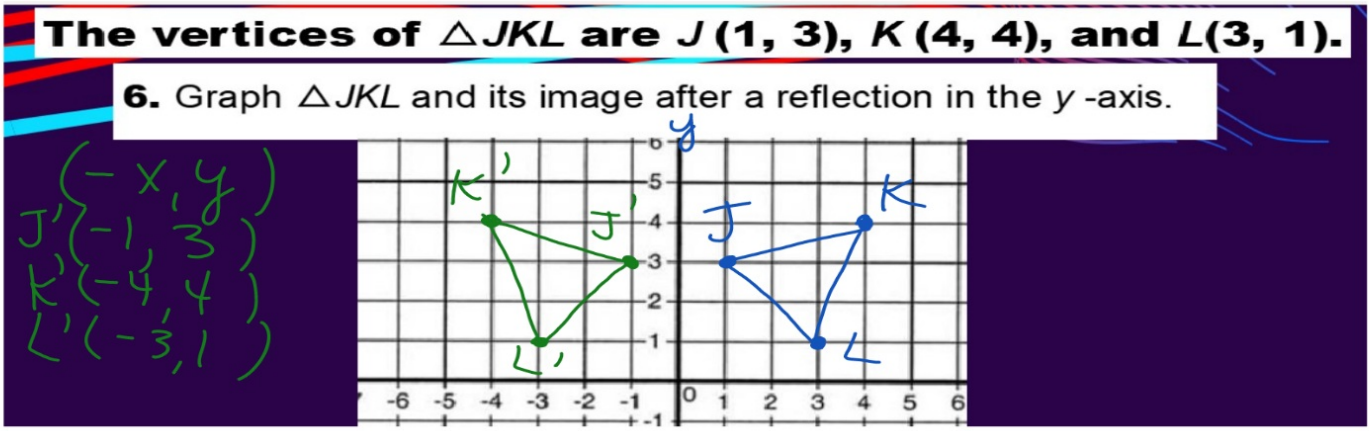
$D(4, 2) \rightarrow D'(7, 1)$

The vertices of △*JKL* are *J* (1, 3), *K* (4, 4), and *L*(3, 1).

5. Graph △*JKL* and its image after a reflection in the *x* -axis.

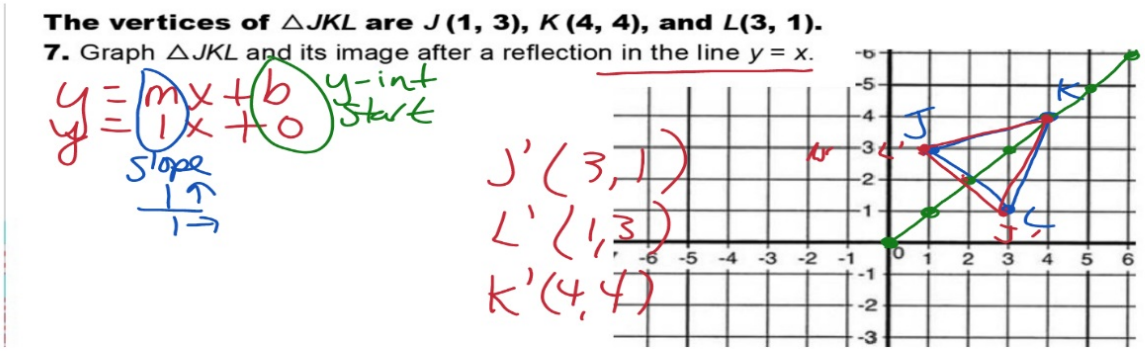


6. Graph △*JKL* and its image after a reflection in the *y* -axis.

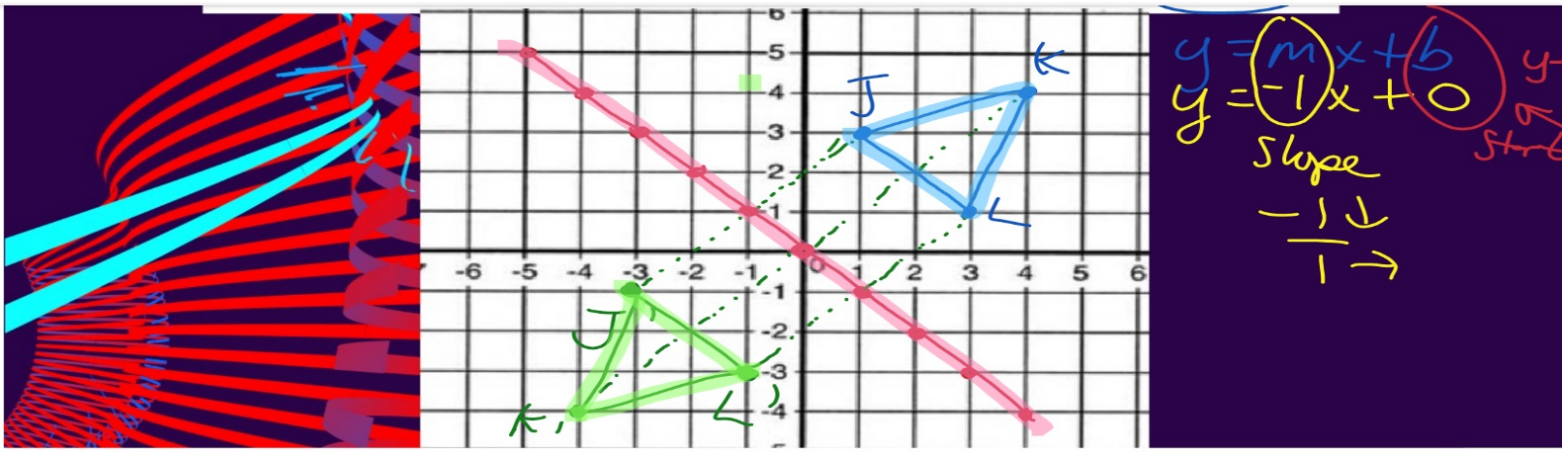


The vertices of △*JKL* are *J* (1, 3), *K* (4, 4), and *L*(3, 1)

7. Graph △*JKL* and its image after a reflection in the line $y = x$.



8. Graph △*JKL* and its image after a reflection in the line $y = -x$.



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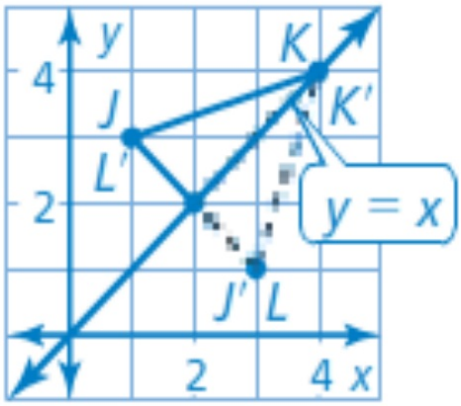

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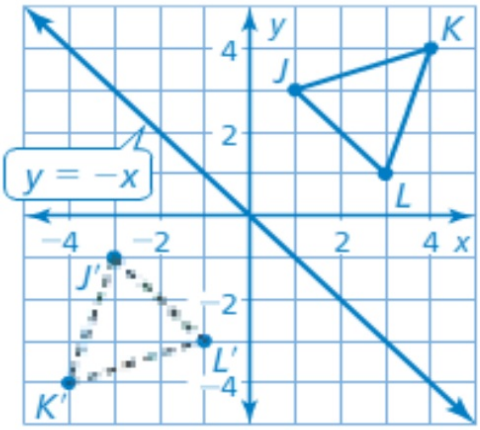

Graph $\triangle ABC$ with vertices $A(3, 2)$, $B(6, 3)$, and $C(7, 1)$ and its image after the glide reflection.

Translation $(x, y) \rightarrow (x - 12, y)$

Reflection in the x-axis

SOLUTION

Begin by graphing $\triangle ABC$. Then graph $\triangle A'B'C'$ after a translation 12 units left. Finally, graph $\triangle A''B''C''$ after a reflection in the x-axis.