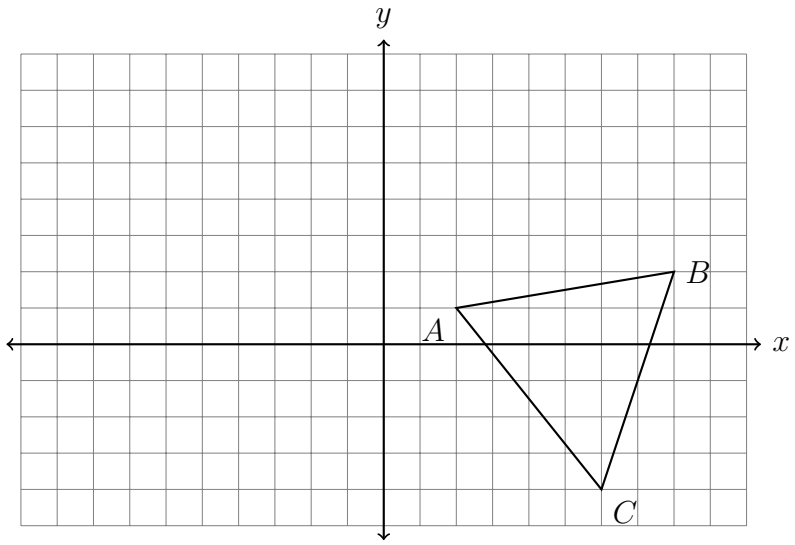
Unit 14: Congruence transformations Name:
6 June 2022

14.1 Classwork: Rigid motions, translation, reflection, rotation

1. Slide $\triangle ABC$ to the left four and up five. Label the image $\triangle A'B'C'$.

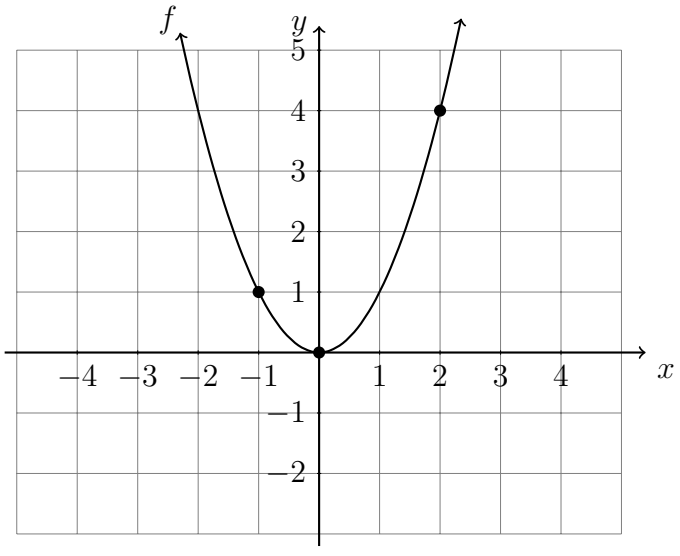


2. Apply the translation $(x, y) \to (x - 1, y + 7)$ to the point $P(-2, -4)$.

3. Complete the t-table for the function f: $y = x^2$, plot the two missing points, labeling them as ordered pairs.

$f(x) = x^2$

x	x^2
-2	
-1	1
0	0
1	
2	4

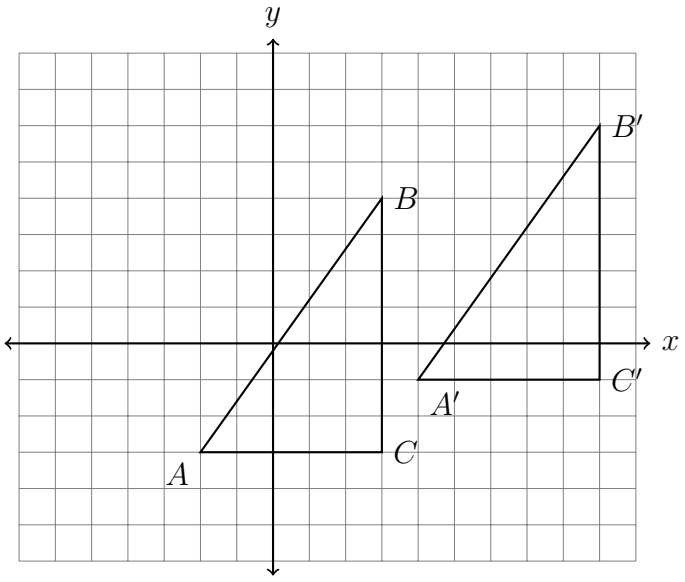


$g(x) = (x - 3)^2$

1	
2	
3	
4	
5	

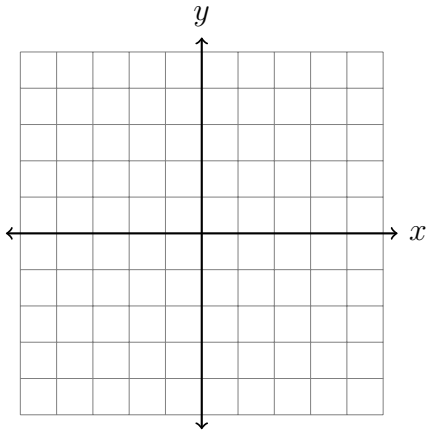
The parabola f is translated three to the right, $f \to g$. Complete the t-table for $g(x) = (x - 3)^2$, plot the points, and draw a smooth curve.

4. Identify the transformation that maps $\triangle ABC$ onto its image $\triangle A'B'C'$.



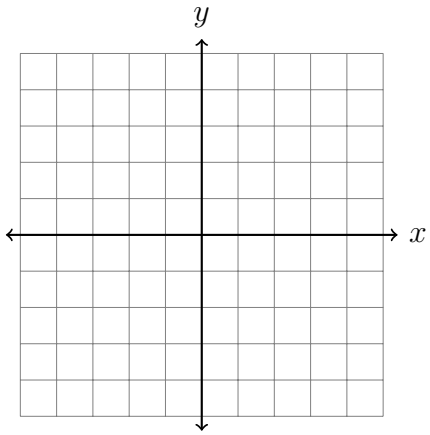
5. State the translation that would map $Q(4, 3)$ onto $Q'(-1, -3)$.

6. On the axes below, plot the point $A(-4, -1)$ and its image, A', after the translation $(x, y) \rightarrow (x + 6, y - 3)$. Label the image as a coordinate pair.



7. Triangle $A'B'C'$ is the image of triangle ABC after a translation of 2 units to the right and 3 units up. Is triangle ABC congruent to $A'B'C'$? Explain why.

8. On the axes below, graph the point $N(-3, 2)$ and its image, N', after a reflection across the x-axis. Mark N' and write it down as a coordinate pair.



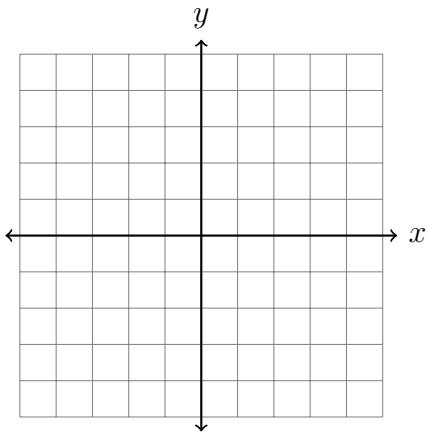
9. What are the coordinates of the image of $B(2, 5)$ after a reflection across the x-axis?

   (a) $(-2, 5)$

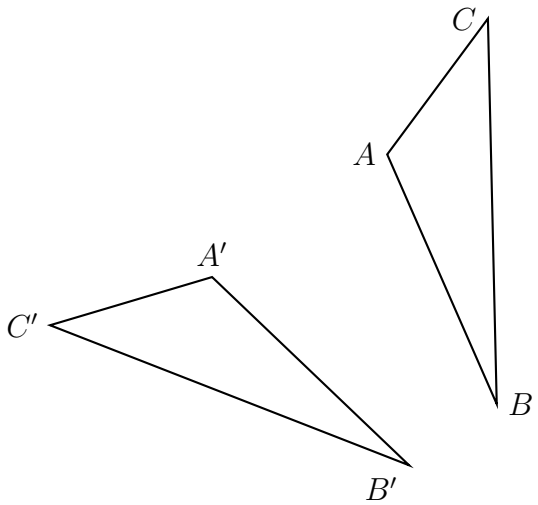
   (b) $(5, 2)$

   (c) $(2, -5)$

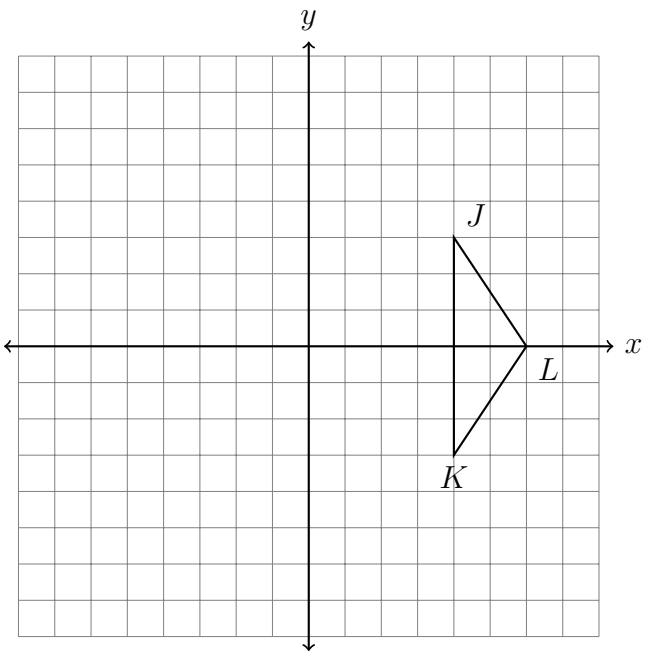
   (d) $(-5, -2)$



10. Draw the line of reflection that would map $\triangle ABC$ onto $\triangle A'B'C'$.

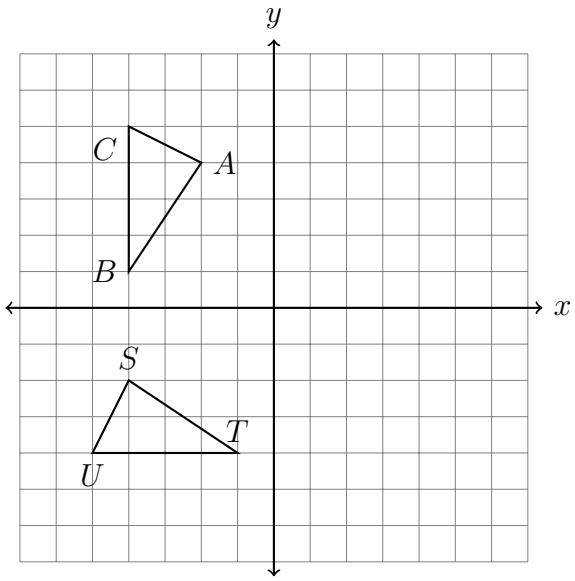


11. Rotate $\triangle JKL$ 90° counterclockwise around the origin on the axes below, labeling the image $\triangle J'K'L'$.



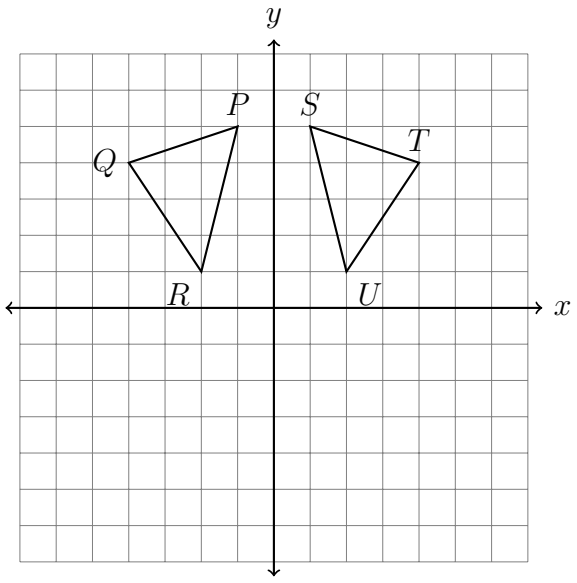
12. On the set of axes below, $\triangle ABC \cong \triangle STU$.

    Describe the rigid motion that maps $\triangle ABC$ onto $\triangle STU$.

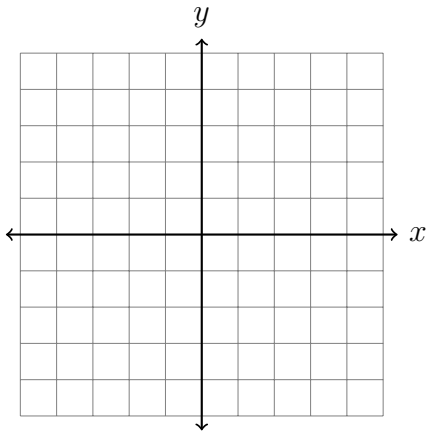


13. The image of triangle ABC after a translation is $\triangle A'B'C'$. Is the area of the triangle greater, smaller, or the same after the translation? Justify your answer.

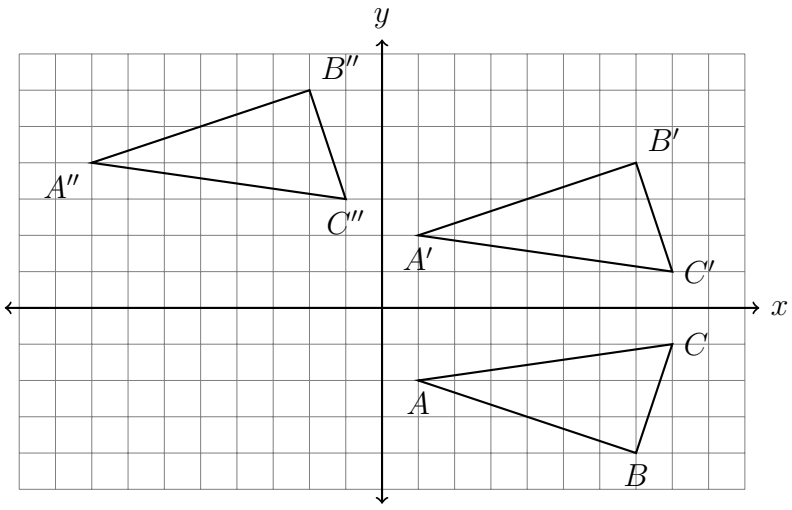
14. Determine and state the transformation mapping $\triangle PQR$ onto $\triangle STU$.



15. State the translation that would map $C(-4, 0)$ onto $C'(3, -3)$. (the use of the grid below is optional)



16. Two transformations have been applied to a triangle in the diagram below, $\triangle ABC \to \triangle A'B'C' \to \triangle A''B''C''$. Fully characterize each transformation.



17. Which of the following would map $\triangle CAT \to \triangle C'A'T'$?

T F Reflected across the y-axis

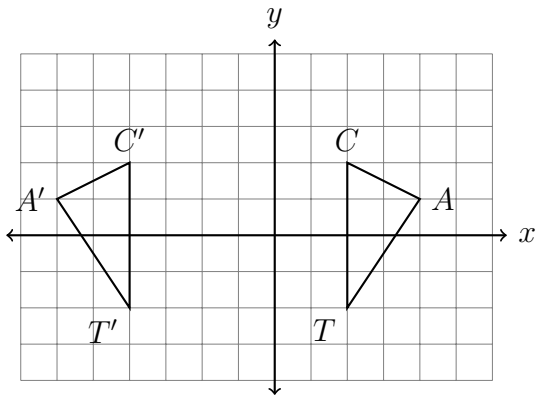
T F Translated six to the left, down zero

T F Reflected across the y-axis, then slid to the left two

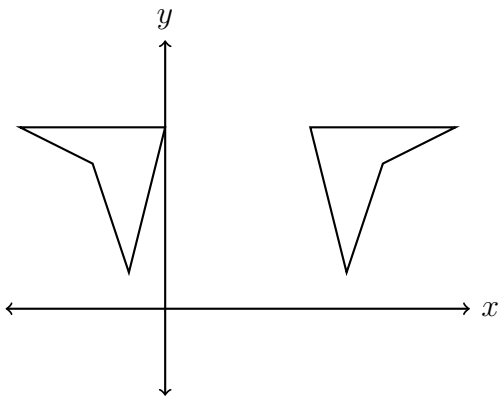
T F $(x, y) \to (x - 6, y + 0)$

T F Rotated 90° counterclockwise around the origin

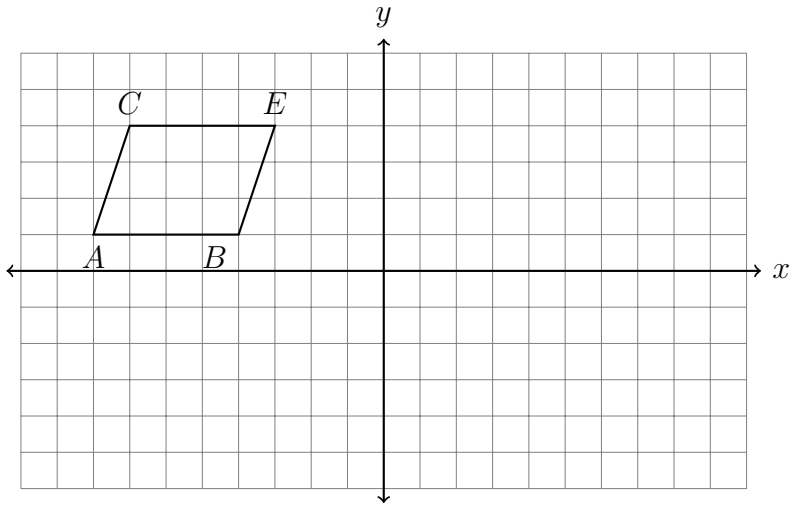
T F Reflected across the line $x = -1$



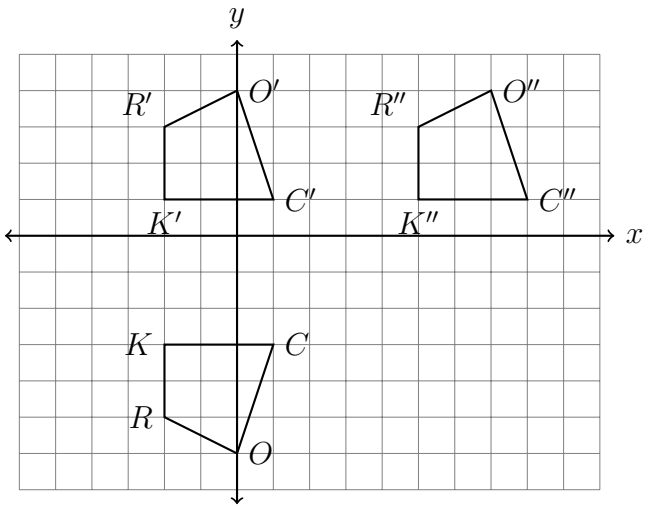
18. Draw the line of reflection for quadrilaterals in the diagram below.



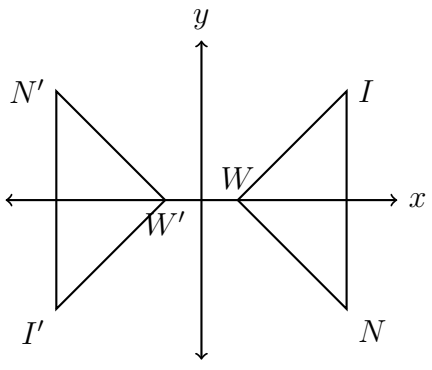
19. First reflect the trapezoid $BECA$ across the x-axis, then move it down 1 and right 7. Label the images $B'E'C'A'$ and $B''E''C''A''$.



20. The quadrilateral $ROCK$ undergoes rigid motions, shown below. Describe the sequence of transformations applied.



21. Given $\triangle WIN \cong \triangle W'I'N'$. Describe the rigid motion mapping $\triangle WIN \to \triangle W'I'N'$.



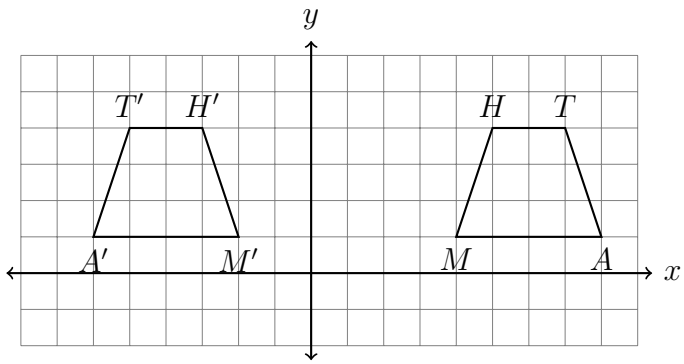
22. The quadrilateral $MATH$ is mapped to $M'A'T'H'$ by a rigid motion. What transformation a been applied?

    (a) Dilation

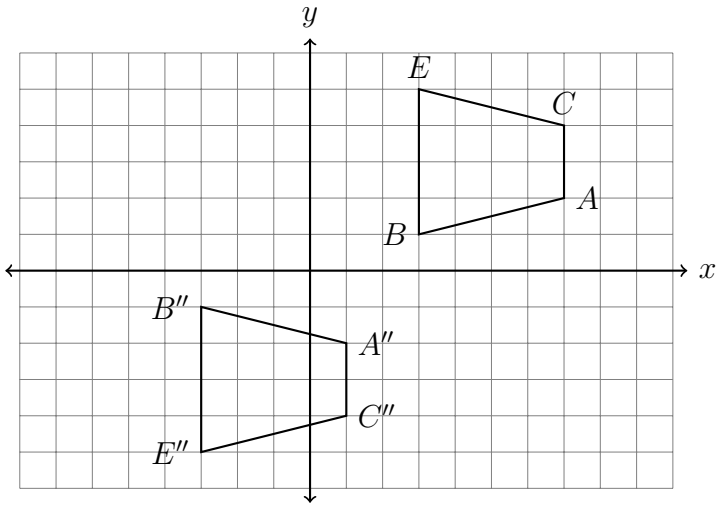
    (b) Reflection

    (c) Rotation

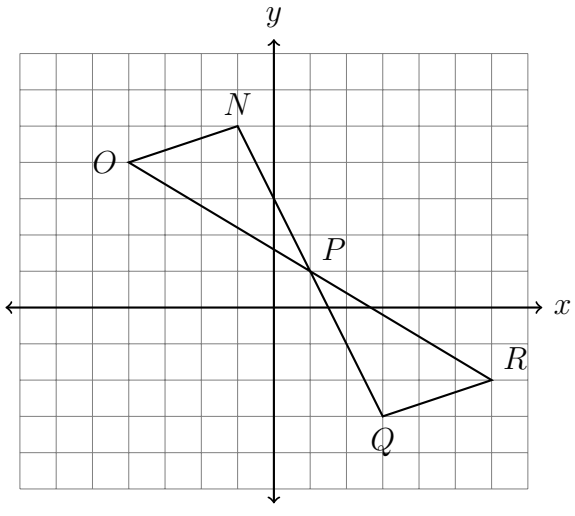
    (d) Translation



23. Determine and state the sequence of transfromations applied to map $BECA$ to $B''E''C''A''$.



24. Determine and state the transformation mapping $\triangle NOP$ onto $\triangle QRP$.



25. What are the coordinates of the image of $C(4, 0)$ after a rotation of $90°$ counterclockwise around the origin?

(a) $(4, 4)$

(b) $(0, 4)$

(c) $(-4, 0)$

(d) $(0, -4)$