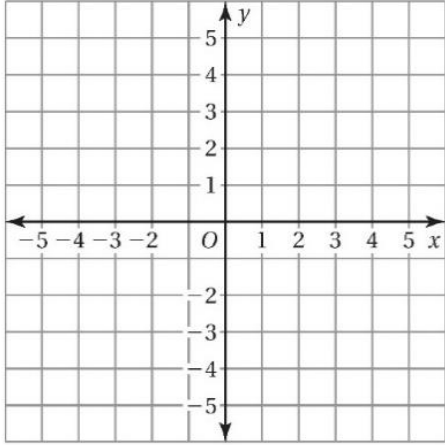


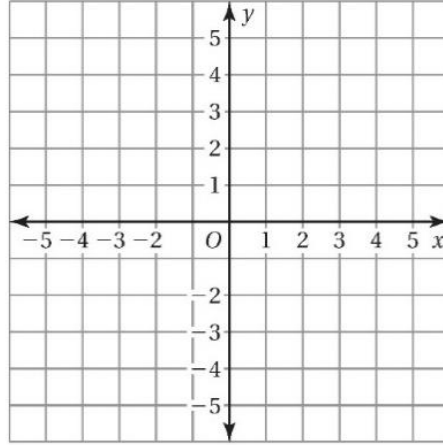
9.5 – Composition of Transformations

Find the image of $Z(1, 1)$ after two reflections, first across line ℓ_1 , and then across line ℓ_2 .

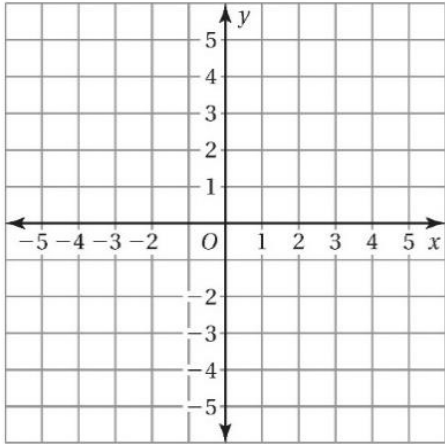
1) $\ell_1 : x = 2, \ell_2 : y\text{-axis}$



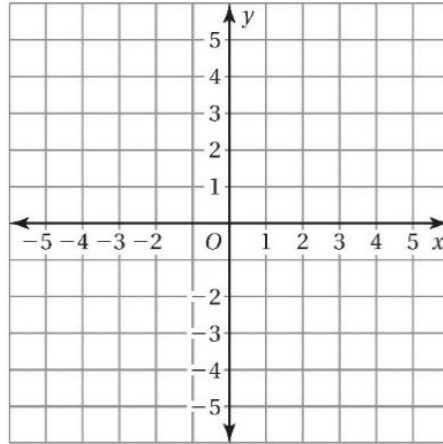
2) $\ell_1 : x = -2, \ell_2 : x\text{-axis}$



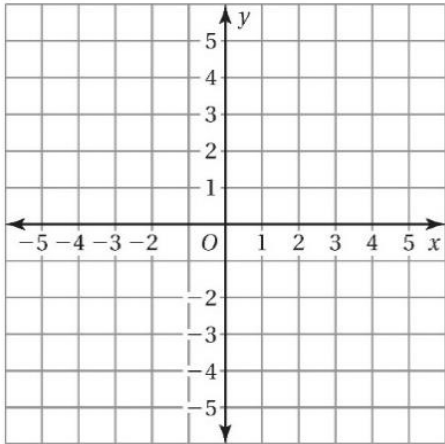
3) $\ell_1 : y = 2, \ell_2 : x\text{-axis}$



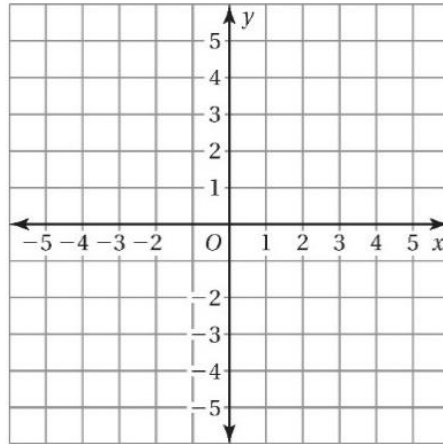
4) $\ell_1 : y = -3, \ell_2 : y\text{-axis}$



5) $\ell_1 : x = 3, \ell_2 : y = 2$

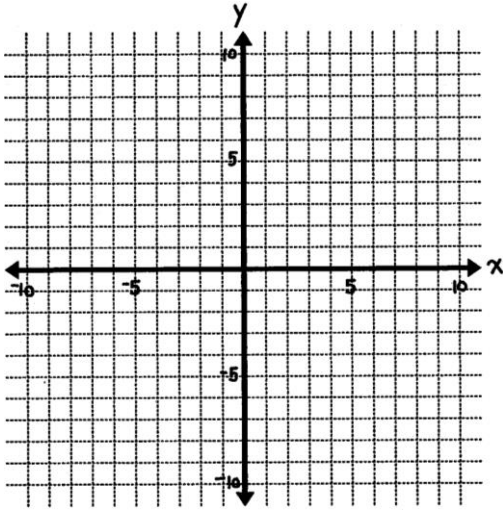


6) $\ell_1 : x = -1, \ell_2 : y = -3$

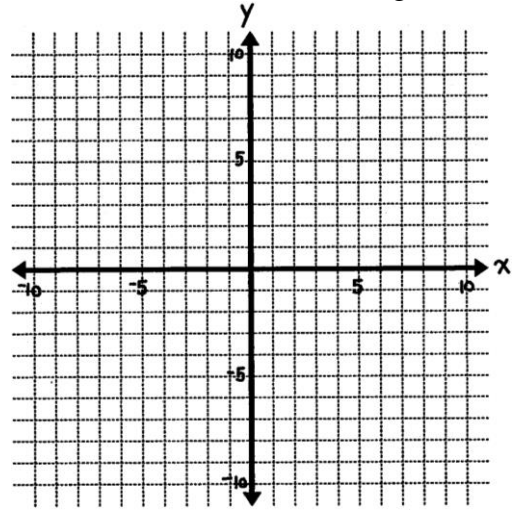


In the following, graph $\triangle RST$ with vertices $R(2,3)$, $S(-2,1)$ and $T(-1,5)$ and its image after the composition. (Do each one of these on a separate coordinated plane.)

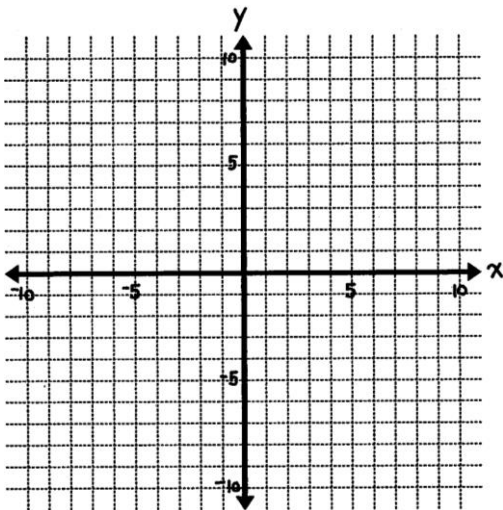
- 7) Translation: $(x, y) \rightarrow (x-2, y-1)$
 Rotation: 90° counter-clockwise about the origin



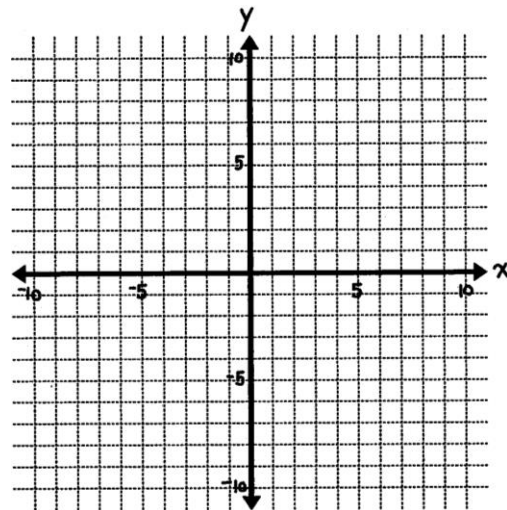
- 8) Reflection: Across the line $y = x$
 Rotation: 180° about the origin



- 9) Translation: $(x, y) \rightarrow (x+3, y)$
 Reflection: Across the line $x = 0$



- 10) Translation: $(x, y) \rightarrow (x+4, y+2)$
 Rotation: 270° clockwise about the origin



11) In your own words, what is a composition of transformations?

12) What is a glide reflection?

- 13) State the “Reflections over Parallel Lines Theorem”:
- 14) State the “Reflection over the Axes Theorem”:
- 15) Is it possible to have an object that does not have rotational symmetry? Explain your reasoning.
- 16) What kind of polygon has an angle of rotation of 72° ?
- 17) A triangle is reflected across line ℓ and then across line m . If this composition of reflections is a translation, what is true about m and ℓ ?