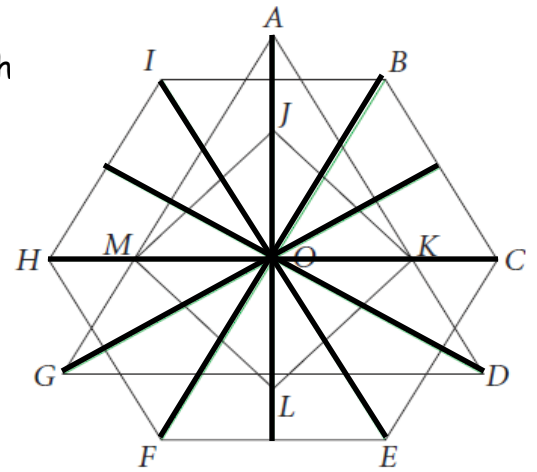


The large triangle, quadrilateral, and hexagon are all regular polygons with center point  $O$ . Find the image of each point or segment for the given rotation. (Hint: the Bold segments form 30 degree angles).



- |   |   |
|---|---|
| 21. $120^\circ$ rotation of $B$ about $O$ | 22. $270^\circ$ rotation of $L$ about $O$             |
| 23. $60^\circ$ rotation of $E$ about $O$  | 24. $300^\circ$ rotation of $\overline{IB}$ about $O$ |
| 25. $240^\circ$ rotation of $G$ about $O$ | 26. $180^\circ$ rotation of $\overline{JK}$ about $O$ |

27. a. Find the image of the composition of reflecting segment  $BC$  over line  $AO$ , then again over line  $HO$ .
- b. Describe the single transformation that could accomplish the composition from part a.

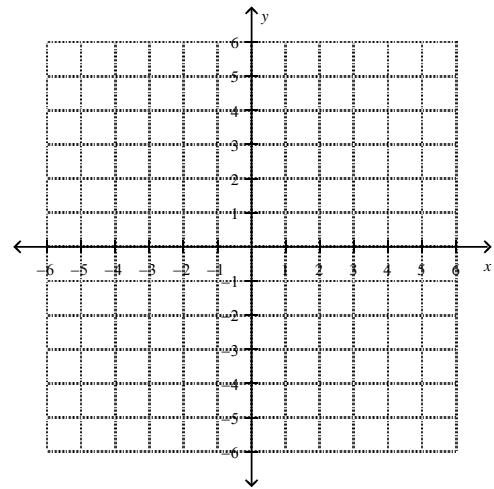
28. Given that  $H$  is between  $J$  and  $K$ ,  $JK = 48$ ,  $JH = 4x - 15$ , and  $HK = 3x + 3$ , find the value of  $x$ , the length of  $JH$ , and the length of  $HK$ .

29. The vertices of a triangle are  $D(-2, 2)$ ,  $E(-2, -3)$  and  $F(5, -3)$ . Graph and label the image with a reflection over the line  $y = -x$ . Name the image vertices below.

$D'$  \_\_\_\_\_  $E'$  \_\_\_\_\_  $F'$  \_\_\_\_\_

Write the algebraic rule for a reflection over  $y = -x$ .

\_\_\_\_\_



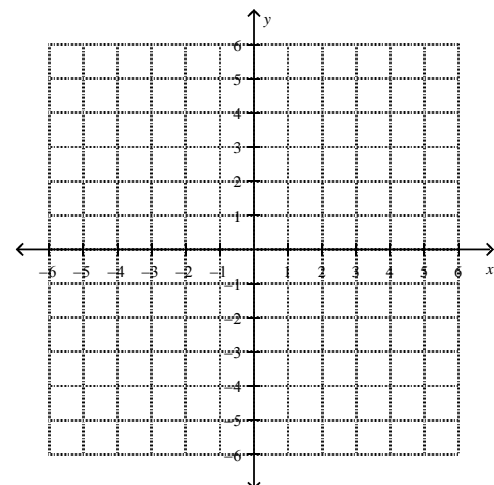
30. Graph and label the points  $J(-2, 2)$ ,  $K(-3, 1)$ ,  $L(2, 1)$  and  $M(4, 3)$  and then rotate the figure  $270^\circ$ . Graph and label the image points, and write their coordinates below. Then, write the algebraic rule for the transformation.

$J'$  \_\_\_\_\_  $K'$  \_\_\_\_\_

$L'$  \_\_\_\_\_  $M'$  \_\_\_\_\_

Write the algebraic rule for the rotation  $270^\circ$ :

\_\_\_\_\_



31. Given  $A(3, 1)$ ,  $B(7, 1)$ ,  $C(3, 4)$ ...

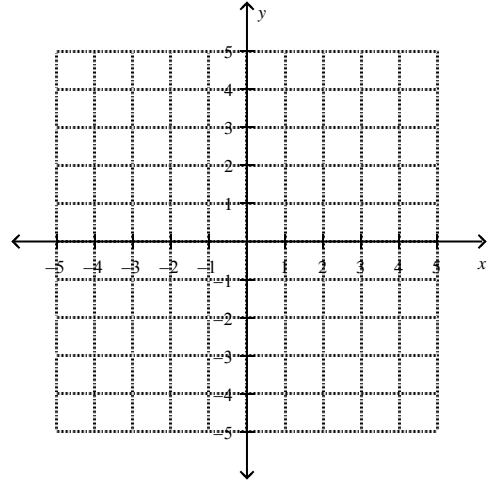
- Find the image of the composition of reflecting  $\triangle ABC$  over  $x = 2$ , then over  $x = -4$ .
- Describe the single transformation that could accomplish the composition from part a.

32. Graph  $\triangle ABC$  with  $A(5, -3)$ ,  $B(2, -4)$ , and  $C(1, 1)$ , then graph the image of  $\triangle ABC$  after the translation of  $\langle 4, 1 \rangle$  then reflection over the  $x$ -axis.

Label all your points then, write the coordinates of the final image below.

Image \_\_\_\_\_

Write the Algebraic Rule: \_\_\_\_\_



33. Given  $A$  is the midpoint of segment  $SM$ . If  $SA = x^2 + 3x$  and  $AM = x + 35$ , find  $SA$ .

34. Find  $3(x + 2)^2 - (x + 2) - 4(5x + 1)$

35. Find the vertex form of  $y = 2x^2 + 6x + 7$ . Show your work by hand.

36. Solve the inequality and write your answer in set notation.  $0 \geq 3x^2 - 2x - 5$

37. Solve for  $x$ .  $0 = x^2 - 4x - 8$

38. Solve  $\sqrt{3x+7} = x-1$

39. For each function, find the requested information. Graph on separate paper, using at least 4 points.

a.  $f(x) = \frac{3}{x+2} - 4$

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

Explain how graph changed from parent: \_\_\_\_\_

b.  $g(x) = \sqrt[3]{x-2} + 4$

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Vertex: \_\_\_\_\_

Explain how graph changed from parent: \_\_\_\_\_

40. If  $x$  varies directly as the cube root of  $y$ , and  $x = 6$  when  $y = 27$ , find  $x$  when  $y = 64$ .