

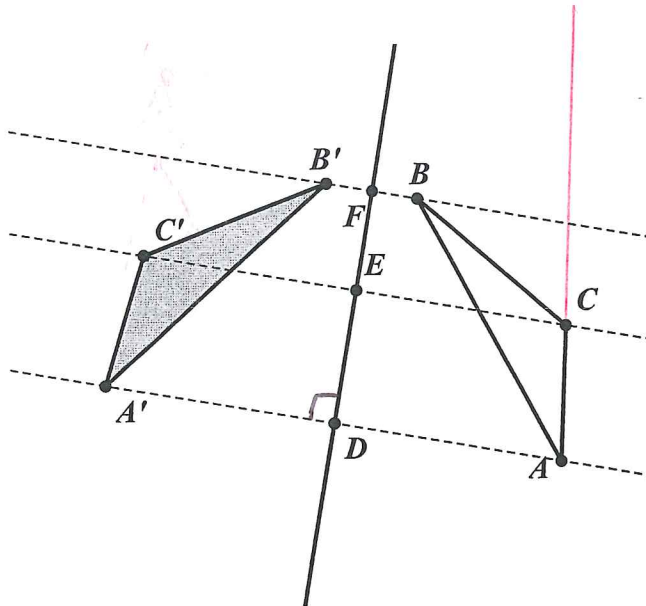
Lines & Transformations

Success Criteria	Proficient	Approaching Proficiency	Not proficient
I can describe a transformation on a coordinate plane given the preimage & image.			
I can write a transformation rule in coordinate notation given the preimage and image.			
I can find the slope of a line perpendicular to another line.			
I can write an equation of a line in simplified form.			
I can find the slope of a line parallel to another line.			
I can identify a sequence of reflections over intersecting lines as a rotation.			
I can identify a sequence of reflections over parallel lines as a translation.			
I can rotate a figure on a coordinate plane.			
I can reflect a figure on a coordinate plane.			
I can translate a figure on a coordinate plane.			
I can write an equation of a line parallel to another line.			
I can write an equation of a line perpendicular to another line.			
I can reflect a figure using a compass.			
I can rotate a figure using a compass and protractor.			
I know the properties for the construction of a reflection.			
I know the properties for the construction of a rotation.			
I can find the angle of rotational symmetry.			
I can draw in lines of symmetry.			

CONSTRUCTIONS OF TRANSFORMATIONS

YOU WILL NEED TO BE ABLE TO CONSTRUCT A ROTATION AND REFLECTION USING A COMPASS AND PROTRACTOR. ADDITIONALLY, YOU WILL NEED TO KNOW THE PROPERTIES OF EACH CONSTRUCTION.

1. Name the type of transformation constructed: reflection



True or False:

F 2. $\overline{C'C} \cong \overline{CA}$

T 3. $\overline{AA'} \perp \overline{DE}$

F 4. $\overline{BB'} \perp \overline{CA}$

T 5. $\overline{EC'} \cong \overline{EC}$

6. Determine the direction and angle of rotation for the construction: rotation

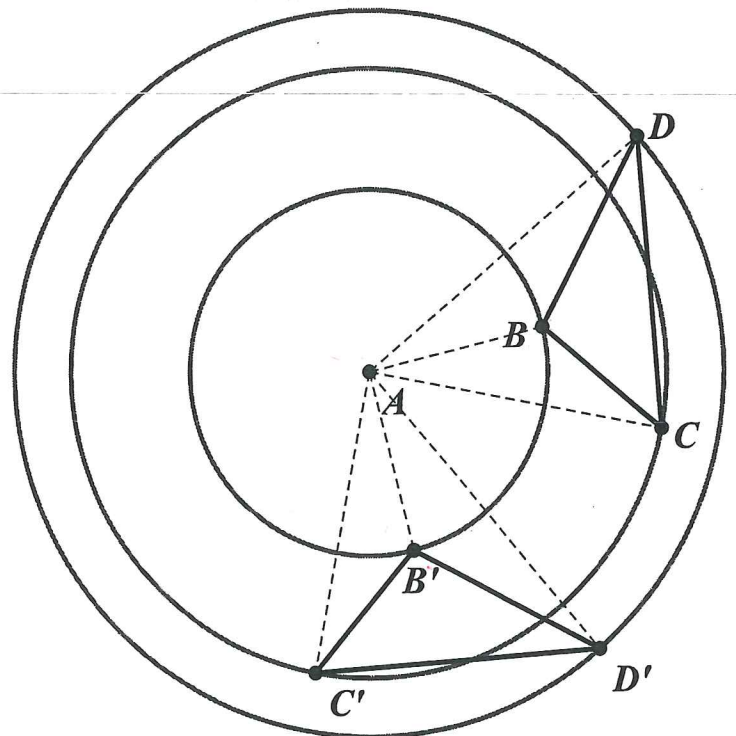
True or False:

T 7. $\overline{D'A} \cong \overline{DA}$

F 8. $\angle DAD' \cong \angle CAD'$

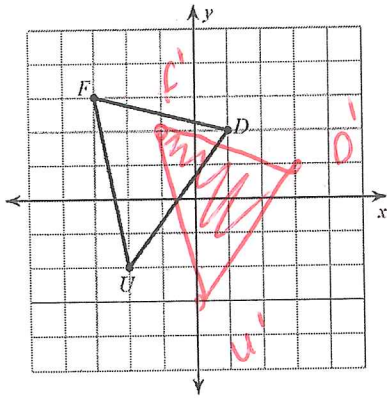
T 9. $\overline{B'A} \cong \overline{BA}$

T 10. $\angle CAC' = \angle BAB'$

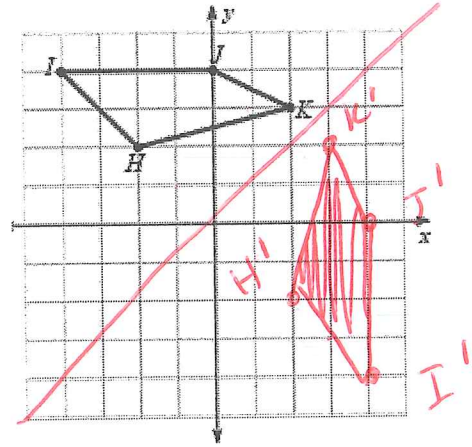


Graph each transformation.

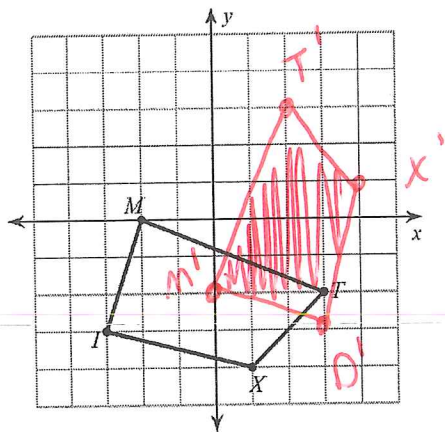
11. $(x, y) \rightarrow (x + 2, y - 1)$



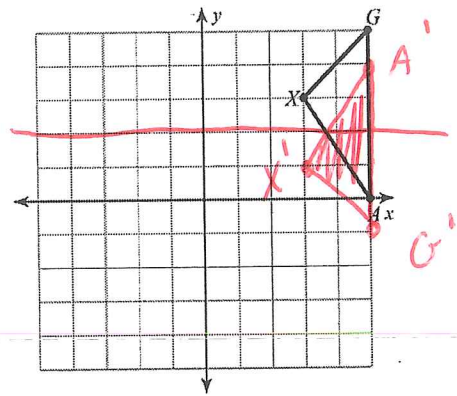
12. reflection across $y = x$



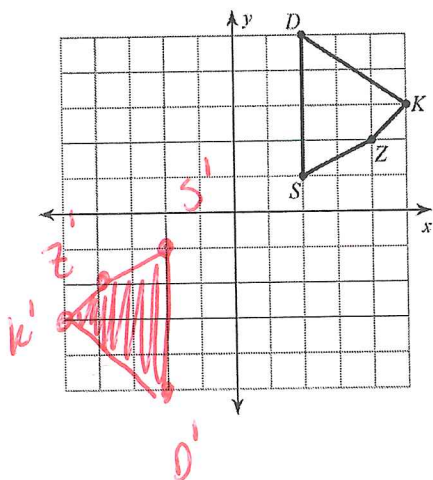
13. rotation 90° counterclockwise about the origin



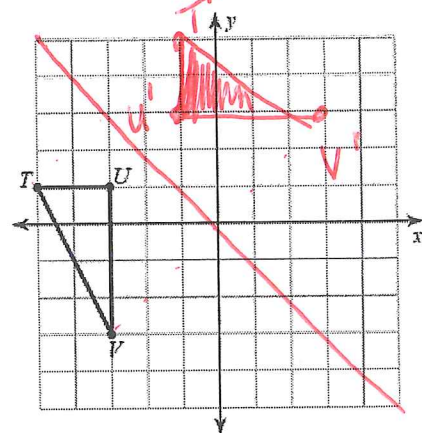
14. reflection across $y = 2$



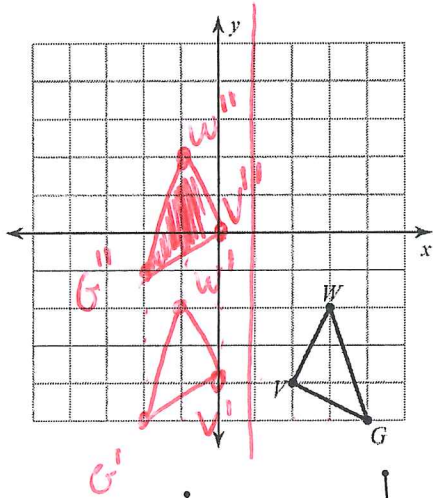
15. rotation 180° about the origin



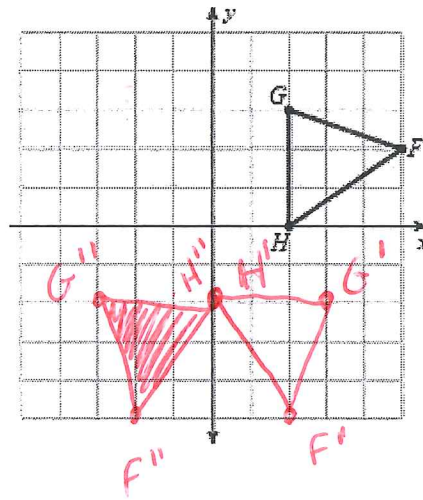
16. reflection across $y = -x$



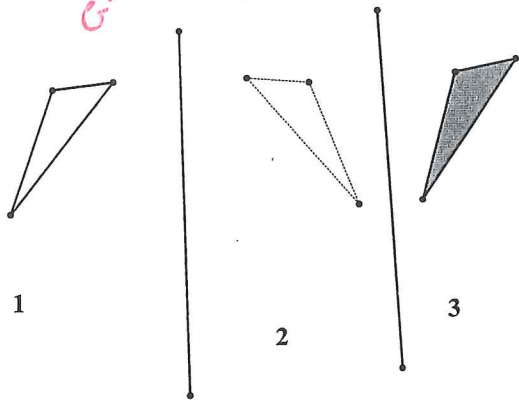
17. reflect across $x = 1$ then $(x, y) \rightarrow (x, y + 4)$



18. Rotation 90° clockwise then reflect over y -axis

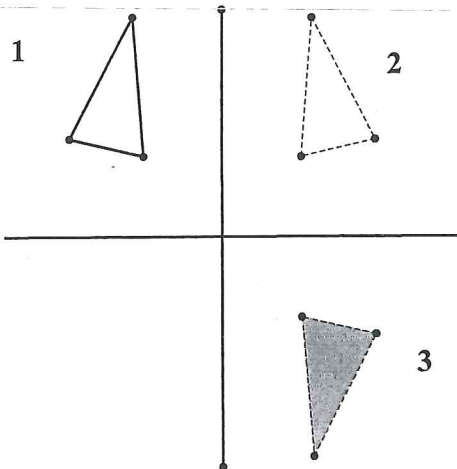


19.



The sequence of reflections over two parallel lines (figure 1 to 3) is a translation

20.



The sequence of reflections over two intersecting lines (figure 1 to 3) is a rotation

Write the equation of each line in simplified form.

21. $4x - 5y = 15$

$y = \frac{4}{5}x - 3$

22. $y + 1 = \frac{4}{3}(x + 2)$

$y = \frac{4}{3}x + 1.666$

23. through $(4, -5); m = -2$

$y = -2x + 3$

Find the slopes of lines AB & CD, then determine if they are parallel, perpendicular, or neither.

24. $A(-2, -5), B(4, 7), C(0, 2), D(8, -2)$

$$\frac{12}{6} = 2 \quad \frac{-4}{8} = -\frac{1}{2}$$

$$\frac{7 - (-5)}{4 - (-2)} = \frac{12}{6}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Ans: perpendicular

25. $A(-8, -7), B(4, -4), C(-2, -5), D(1, 7)$

$$\frac{3}{12} = \frac{1}{4} \quad \frac{12}{3} = 4$$

Ans: neither

Write the equation of a line through the point and PERPENDICULAR to the line.

26. through $(-4, 2)$ perp to $y = \frac{2}{3}x - 1$

$$y = -\frac{3}{2}x - 4$$

27. through $(-1, 3)$ perp to $y = 6x - 1$

$$y = -\frac{1}{6}x + 2.8$$

28. Write an equation in slope-intercept form for a line containing $(-3, 6)$ that is parallel to the graph of $y = -\frac{3}{4}x + 3$.

$$y = -\frac{3}{4}x + 3.75$$

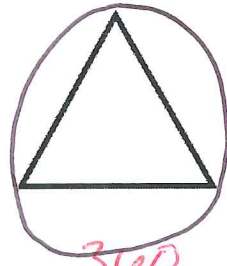
Find the angle of rotational symmetry for each figure.

29.



$$\frac{360}{4} = 90$$

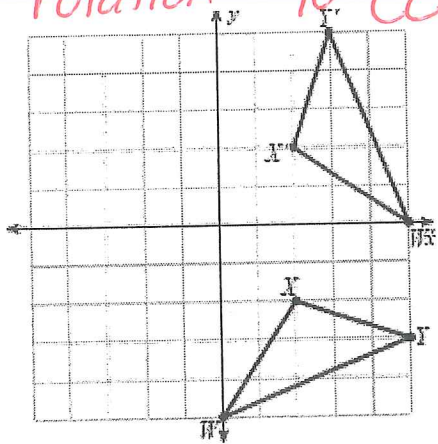
30.



$$\frac{360}{3} = 120$$

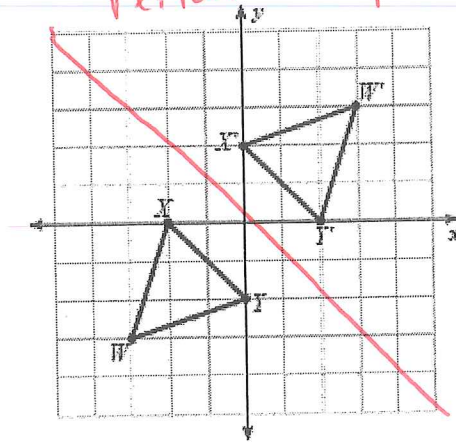
Describe each transformation. If it is a reflection, draw in the line of reflection.

31. *rotation 90 CCW*

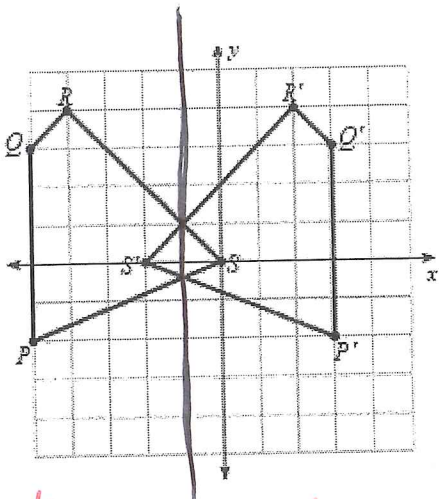


32.

reflection $y = -x$

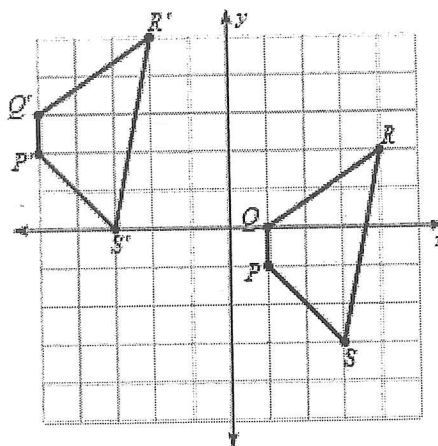


33.



reflection $x = -1$

34.



*translation left 3
up 3*

Write a rule in coordinate notation for each transformation.

35. $A(-3, -1)$ $B(-4, 4)$ $C(-2, 4)$ $D(2, 1)$

$A'(3, -1)$ $B'(4, 4)$ $C'(2, 4)$ $D'(-2, 1)$

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

36. $U(-5, 1)$ $V(-2, 3)$ $W(-5, -1)$ *$x = -5$ $y = -1$*

$U'(5, -1)$ $V'(2, -3)$ $W'(5, 1)$

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

37. $P(2, -2)$ $Q(1, 3)$ $R(5, -1)$ *$x = 5$ $y = -1$*

$P'(2, -2)$ $Q'(-3, -1)$ $R'(1, -5)$ *$(-y, -x)$*

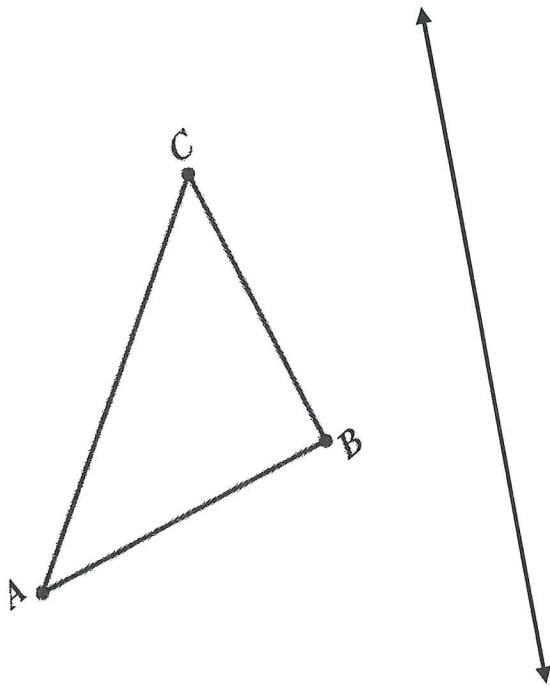
$(x, y) \rightarrow (-y, -x)$

38. $Y(-3, -5)$ $X(-5, 0)$ $W(-2, -1)$

$Y'(4, -1)$ $X'(2, 4)$ $W'(5, 3)$

$(x, y) \rightarrow (x+7, y+4)$

39. Reflect the figure over the given line using a compass.



40. Rotate the figure 70° counterclockwise using a compass and protractor.

