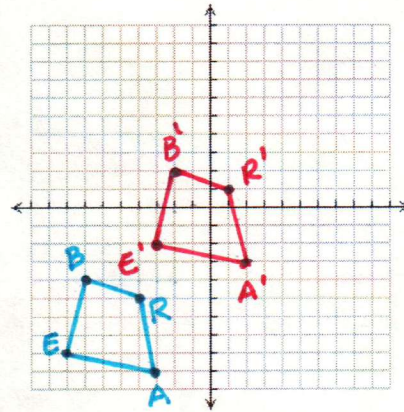


Translation: You will need to be able to translate a figure when given a rule, translate to a given point, and write a rule when given the pre-image and image.

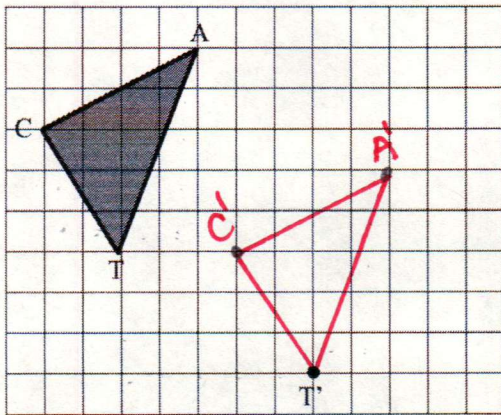
1. Plot the points:

- B (-7, -4)
- E (-8, -8)
- A (-3, -9)
- R (-4, -5)

Translate:  $(x+5, y+6)$   
 right 5 up 6

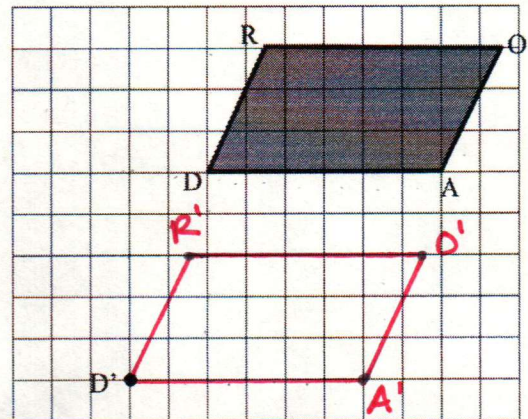


2. Translate CAT → C'A'T'



Write the rule:  $(x, y) \rightarrow (x+5, y-3)$

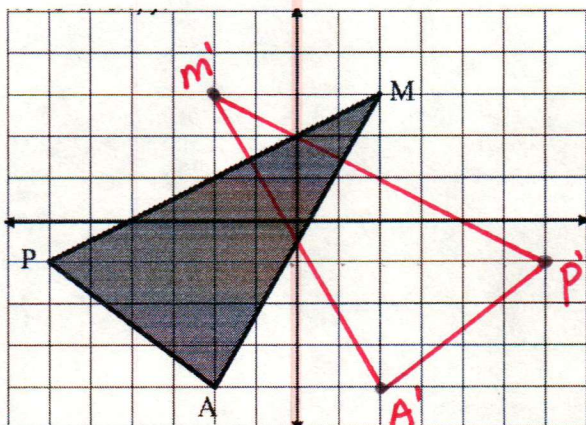
3. Translate ROAD → R'O'A'D'



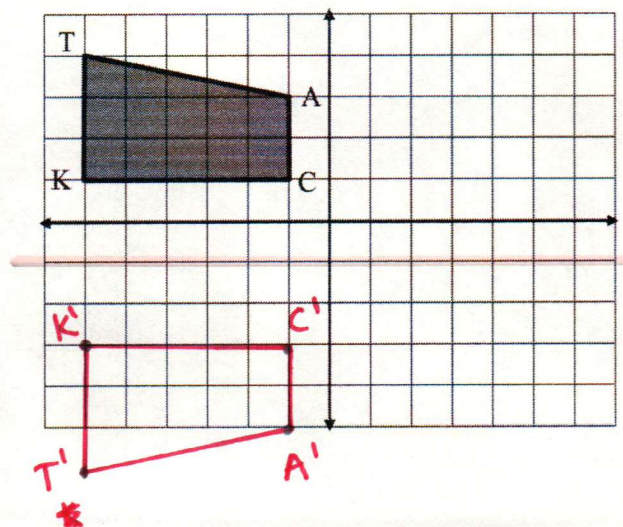
Write the rule:  $(x, y) \rightarrow (x-2, y-5)$

Reflections: You will need to be able to reflect over an axis, over a given horizontal or vertical line, or over a line in the form  $y = mx + b$ .

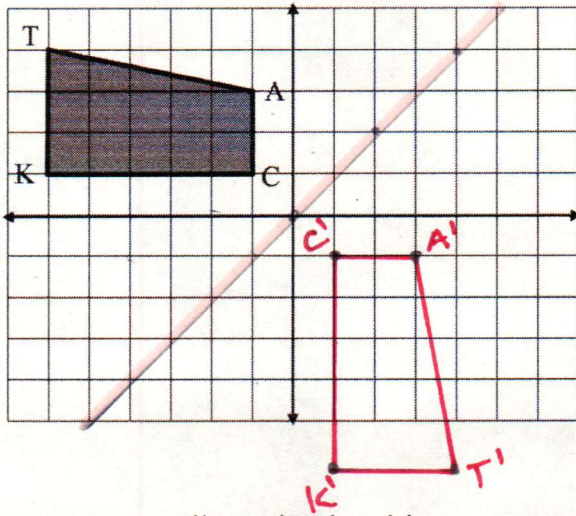
4. Reflect MAP over the y-axis.



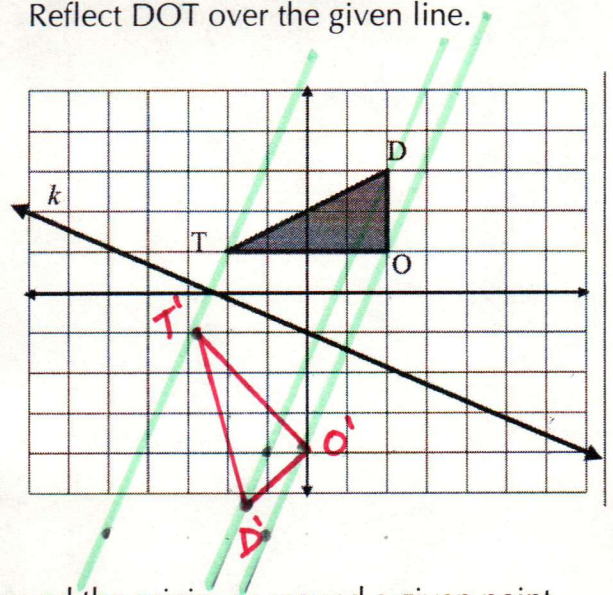
5. Reflect TACK over  $y = -1$



6. Reflect TACK over  $y = x$

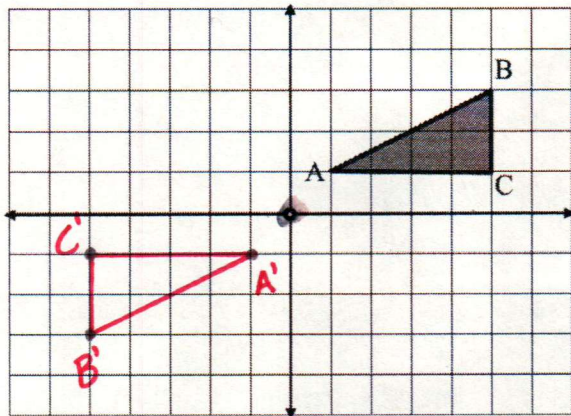


7. Reflect DOT over the given line.  
 $m = -\frac{3}{7}$   $\perp m = \frac{7}{3}$

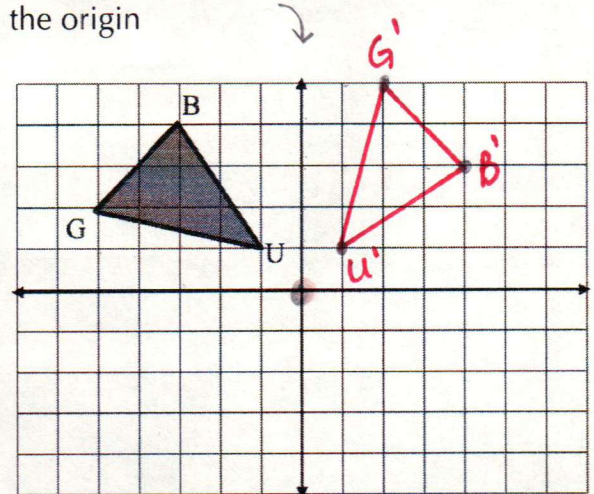


Rotation: You will need to be able to rotate a figure around the origin, or around a given point.

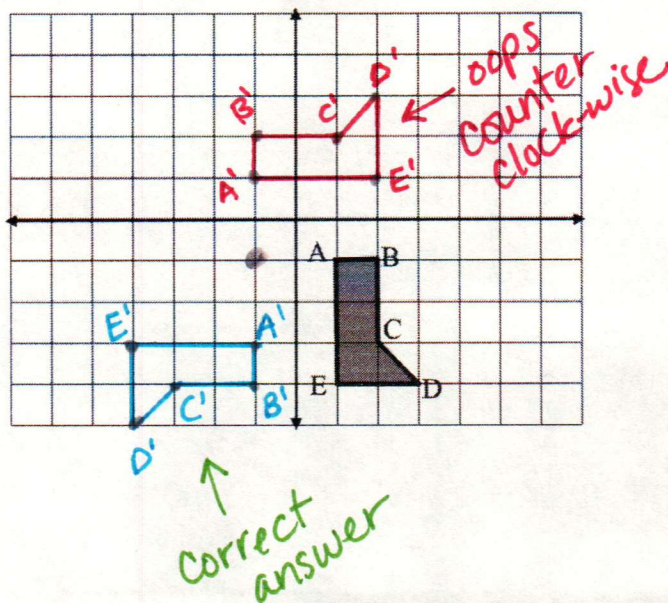
8. Rotate ABC 180° about the origin



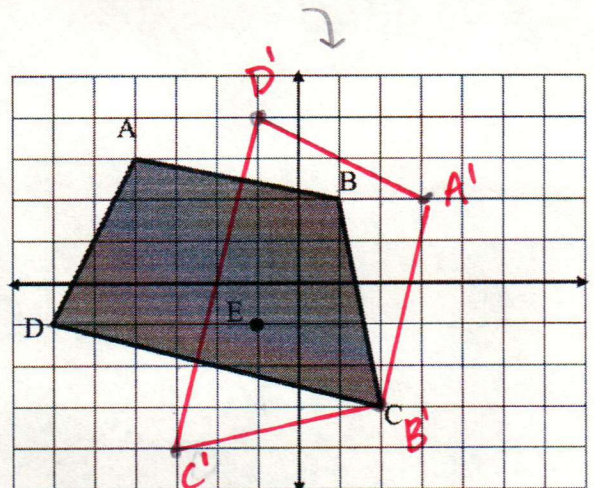
9. Rotate BUG 90° clockwise around the origin



10. Rotate ABCDE 90° clockwise around the point  $(-1, -1)$

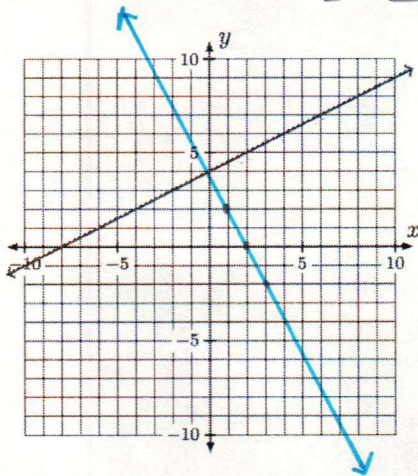


11. Rotate ABCD 90° clockwise around point E

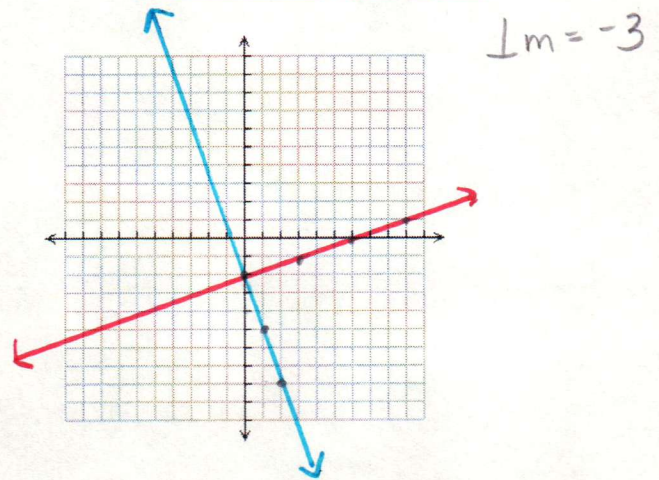


Perpendicular Lines: You will need to be able to write and/or graph the slope of a line that is perpendicular to a given line or equation.

12. Draw a line that is perpendicular to the given line.  $m = \frac{1}{2}$   $\perp m = -2$



13. Graph the line  $y = \frac{1}{3}x - 2$ , then graph a line that is perpendicular to it.



14. Give the slope of a line that is perpendicular to  $y = -\frac{2}{3}x + 4$

$$\perp m = \frac{3}{2}$$

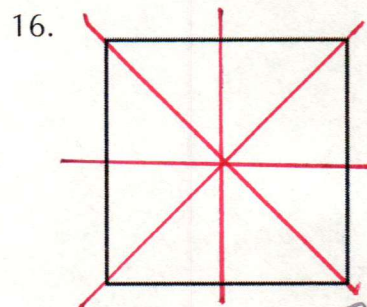
15. Give the slope of a line that is perpendicular to  $y = 2x - 5$

$$\perp m = -\frac{1}{2}$$

Symmetry & Rotational Symmetry: You will need to determine how many and where the lines of symmetry are for a given figure. You will need to be able to find the angle of rotational symmetry for a given figure.

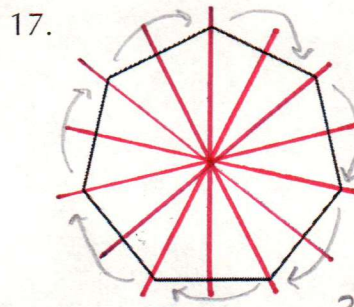
For each figure:

- draw all lines of symmetry and determine the total number of lines of symmetry
- give the angle of rotation if there is rotational symmetry.



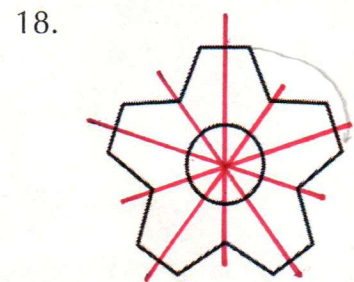
a. **4 lines**

b.  $\frac{360}{4} = 90^\circ$



a. **7 lines**

b.  $\frac{360}{7} = 51.43^\circ$



a. **5 lines**

b.  $\frac{360}{5} = 72^\circ$

19. How many lines of symmetry will a regular 38-gon have? What is the angle of rotation?

38 lines of symmetry,  $\frac{360}{38} = 9.47^\circ$

20. How many lines of symmetry will a regular 14-gon have? What is the angle of rotation?

14 lines of symmetry,  $\frac{360}{14} = 25.71^\circ$