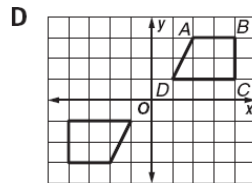
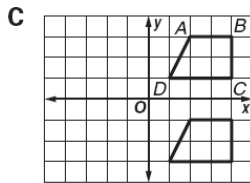
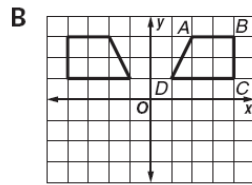
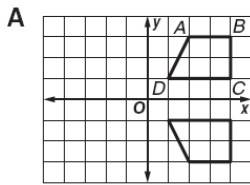


Multiple Choice: Select the correct answer. Write your answer on the line provided.

1) Which of the following is the correct drawing when reflecting $ABCD$ in the x -axis?

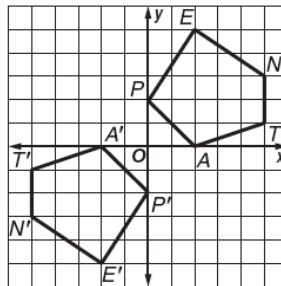
1) _____



2) Matthew is trying to visualize what different transformations look like. One of his drawings was transforming $PENTA$ into $P'E'N'T'A'$. Which transformation is this?

2) _____

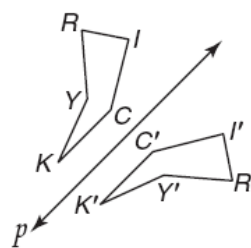
- A** reflection in the x -axis
- B** rotation of 90°
- C** reflection in the y -axis
- D** rotation of 180°



3) Ricky was in an art class in which she wanted the polygon $RICKY$ to be transformed to $R'IC'K'Y'$ using the line p so that she could paint both of them. What kind of transformation is this?

3) _____

- A** reflection
- B** rotation
- C** dilation
- D** translation



4) Which of the following words, when reflected in a vertical line, will be identical to the original word?

4) _____

- A** DECIDE
- B** MOM
- C** DOG
- D** ABIDE

5) Which of the following words remain unchanged when reflected in a horizontal line?

5) _____

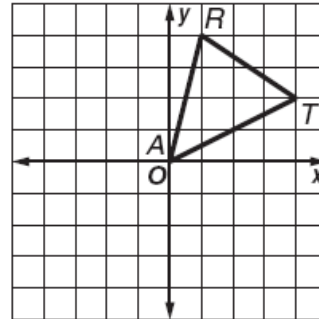
- A WOW
- B ICEBOX
- C BRIDE
- D TOOT

Use the figure for questions 6-8.

6) Write the coordinates of the image of each point by reflection in the x-axis.

6) _____

- A $A'(0, 0), R'(-1, 4), T'(-4, 2)$
- B $A'(0, 0), R'(4, 1), T'(2, 4)$
- C $A'(0, 1), R'(-4, 1), T'(-4, -2)$
- D $A'(0, 0), R'(1, -4), T'(4, -2)$



7) Write the coordinates of the image of each point by reflection in the y-axis.

7) _____

- A $A'(0, 0), R'(-1, 4), T'(-4, 2)$
- B $A'(0, 0), R'(4, 1), T'(2, 4)$
- C $A'(0, 1), R'(-4, 1), T'(-4, -2)$
- D $A'(0, 0), R'(1, -4), T'(4, -2)$

8) Write the coordinates of the image of each point by reflection in the line $y = x$.

8) _____

- A $A'(0, 0), R'(-1, 4), T'(-4, 2)$
- B $A'(0, 0), R'(4, 1), T'(2, 4)$
- C $A'(0, 1), R'(-4, 1), T'(-4, -2)$
- D $A'(0, 0), R'(1, -4), T'(4, -2)$

- 9) $A(0, 0)$, $B(3, 4)$, $C(5, 1)$, and $D(-1, -3)$ are points on a graph. Apply the transformation $(x, y) \rightarrow (x + 1, y + 2)$.

9) _____

Find the images of points A , B , C , and D .

- A** $A'(1, 2)$, $B'(4, 6)$, $C'(6, 3)$, $D'(0, -1)$
B $A'(1, 2)$, $B'(3, 6)$, $C'(6, 2)$, $D'(3, -1)$
C $A'(2, 1)$, $B'(2, 6)$, $C'(4, 3)$, $D'(-1, -1)$
D $A'(0, 0)$, $B'(4, 3)$, $C'(1, 5)$, $D'(-3, -1)$
- 10) Selena was trying to put together a puzzle of geometric shapes on a coordinate grid. One of her pieces was a right triangle. She placed it on the grid so the 3 corners had the coordinates $R(-2, 0)$, $U(0, 0)$ and $N(-2, -6)$. She then rotated her triangle 90° counterclockwise about the origin. What are the new coordinates R' , U' , and N' ?
- A** $R'(0, 2)$, $U'(0, 6)$, $N'(6, -2)$
B $R'(2, 0)$, $U'(0, 0)$, $N'(2, 6)$
C $R'(0, 2)$, $U'(0, 0)$, $N'(-6, 2)$
D $R'(0, -2)$, $U'(0, 0)$, $N'(6, -2)$

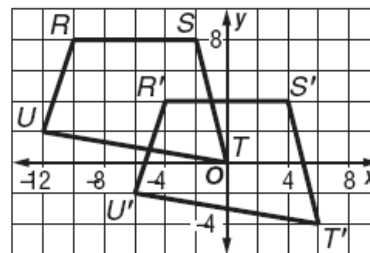
10) _____

- 11) **Notice the scale on the graph is by 2's

11) _____

How would this transformation be described algebraically?

- A** $(x, y) \rightarrow (x + 4, y - 5)$
B $(x, y) \rightarrow (x + 2, y - 7)$
C $(x, y) \rightarrow (x + 6, y - 4)$
D $(x, y) \rightarrow (x + 3, y - 4)$



- 12) R maps point P to P' , and S maps P' to P'' . Find T , the translation that maps P to P'' . Use these translations for R and S .

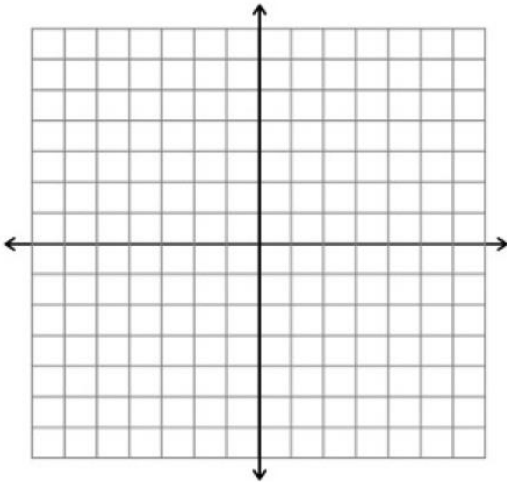
12) _____

$R: (x, y) \rightarrow (x + 1, y + 2)$, $S: (x, y) \rightarrow (x - 5, y + 7)$

- A** $(x - 6, y - 5)$
B $(x - 9, y + 4)$
C $(x + 4, y + 9)$
D $(x - 4, y + 9)$

Free Response: Answer the following questions.

13) Given $A(1, 2)$, $B(1, 4)$, and $C(3, 4)$, find the image of $\triangle ABC$ under a counterclockwise rotation of 90 degrees about the origin. Graph the pre-image and image. Label your pre-image and image points on the graph. Write the coordinates of your image points on the lines provided.



A'	_____
B'	_____
C'	_____

14) Using the figure provided, write a translation rule for each of the following:

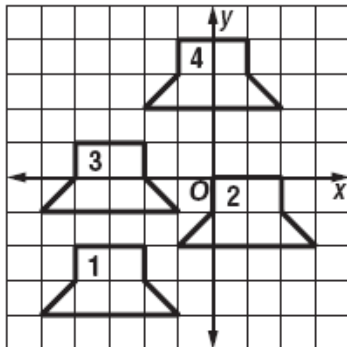
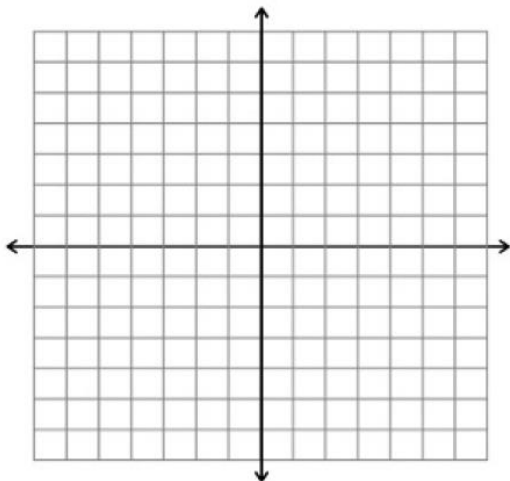


Figure 1 to 2:	_____
Figure 4 to 3:	_____

15) Graph and label a triangle with vertices $A(1, 5)$, $B(4, 1)$, and $C(5, 6)$. Apply a translation with the rule $(x, y) \rightarrow (x - 1, y - 2)$. Label and write the coordinates for triangle $A'B'C'$. Then reflect triangle $A'B'C'$ over the x-axis. Label and write the coordinates for triangle $A''B''C''$.



A'	_____
B'	_____
C'	_____

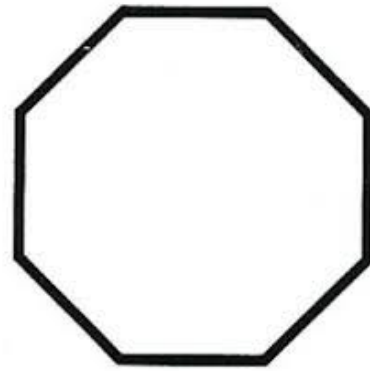
A''	_____
B''	_____
C''	_____

16. What is the name of the shape on the right?

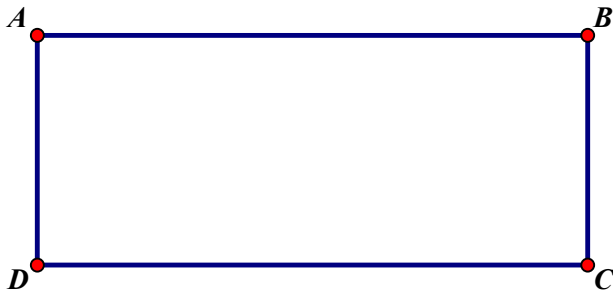
17. How many diagonals are there on the shape to the right?

18. How many lines of symmetry are there on the shape to the right?

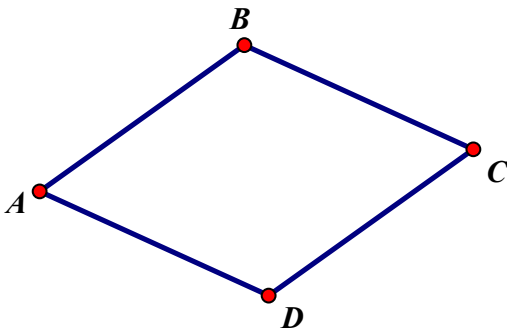
19. List all of the degrees of rotational symmetry for the shape to the right.



20. **Draw and label** the lines of symmetry and the diagonals on the rectangle



21. **Draw and label** the lines of symmetry and the diagonals on the rhombus.



22. How many lines of reflection would be in a regular 18-sided polygon?

23. How many angles of rotational symmetry for a 36-sided regular polygon? _____

Give the first 5 angles of rotational symmetry.

24. How many lines of reflection for an n-sided regular polygon?

25. Which of the following equations is perpendicular to the equation $y = -\frac{2}{3}x + 4$.

(A) $y = -\frac{2}{3}x + 7$

(B) $y = -\frac{3}{2}x + 4$

(C) $y = \frac{3}{2}x - 2$

(D) $y = \frac{2}{3}x + 4$

26. a. Find the slope of a line through the points $(-10, 4)$ and $(4, -3)$.

b. What is the slope of a line parallel to the one in **part a**.

c. What is the slope of a line perpendicular to the one in **part a**.

d. What would be the equation of the line perpendicular to the one in **part a** that goes through the point $(0, -5)$?

e. What would be the equation of the line parallel to the line in **part a** that goes through the point $(-2, 6)$?