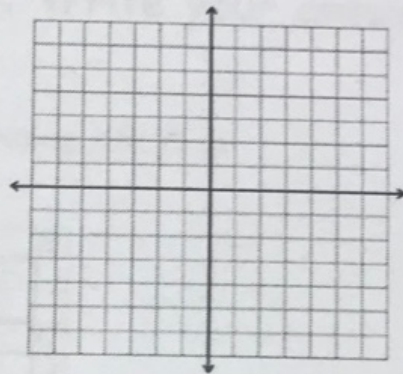Key

1. If a figure is reflected in the x-axis and then it is reflected in the line
   $y = x$, it would be the same as which of the following counterclockwise
   transformations?
   A reflection over the y-axis
   B rotation of 90°
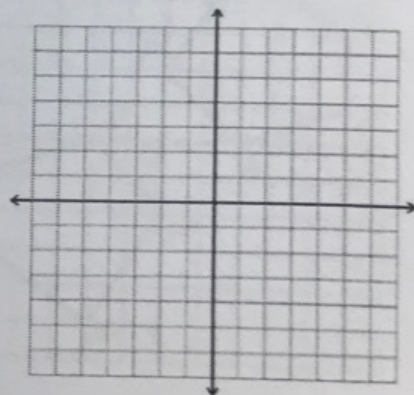   C rotation of 180°
   D rotation of 270°

2. If a figure is reflected in the y-axis and then rotated 180°, it would be
   the same as which of the following transformations?
   A reflection in the x-axis
   B rotation of 90°
   C rotation of 180°
   D rotation of 270°
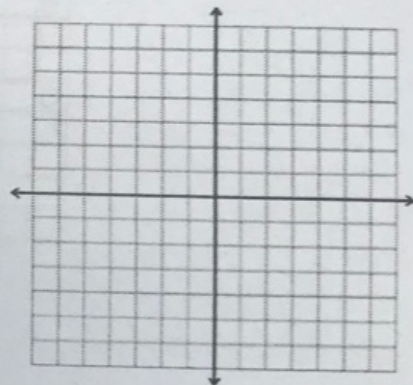
3. If $P'(3, 5)$ is the image of P, find P using the transformation
   $(x, y) \rightarrow (x - 1, y + 6)$.
   A $P(2, 11)$ B $P(2, -1)$
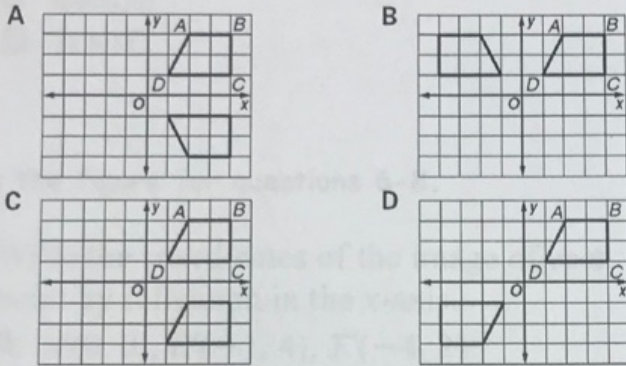   C $P(4, 11)$ D $P(4, -1)$

Math 2

Unit 1 Review

Name: _Key_

Date: _____ Block: _____

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?
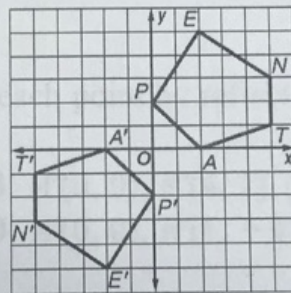
1) __A__

A

B

C

D

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?

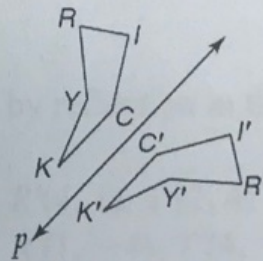 A reflection in the *x*-axis
  B rotation of 90°
  C reflection in the *y*-axis
  D rotation of 180°

2) __D__

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

  A reflection
  B rotation
  C dilation
  D translation

3) __A__

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

  A DECIDE
  B MOM
  C DOG
  D ABIDE

4) __B__

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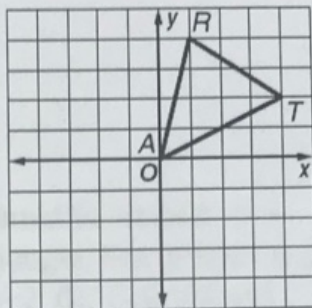
    A WOW

    B ICEBOX

    C BRIDE

    D TOOT

5) __B__

Use the figure for questions 6-8.

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

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

6) __D__

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

    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) __A__

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

    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) __B__

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) _A_

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'?
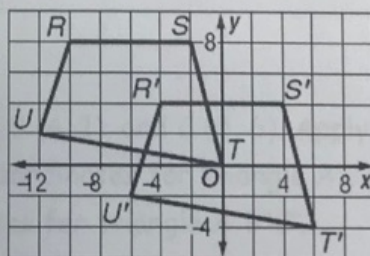
10) _D_

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 $R'(0, -2)$, $U'(0, 0)$, $N'(6, -2)$

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

11) _C_

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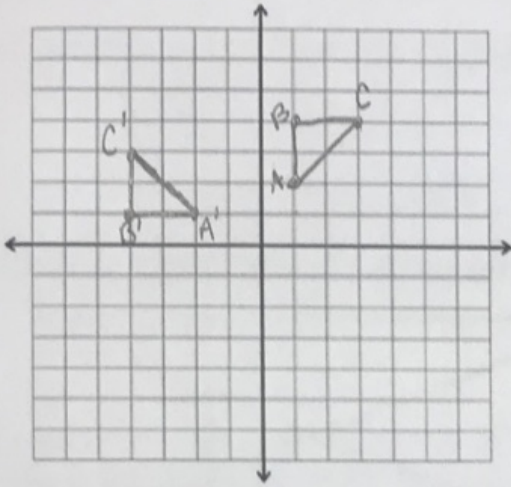$R: (x, y) \rightarrow (x + 1, y + 2)$, $S: (x, y) \rightarrow (x - 5, y + 7)$

12) _D_

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

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' $(-2,1)$

B' $(-4,1)$

C' $(-4,3)$

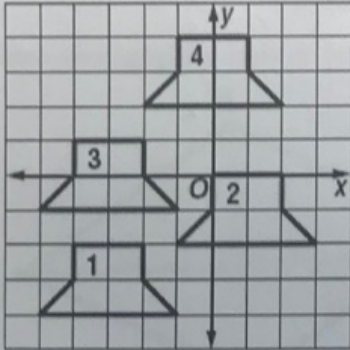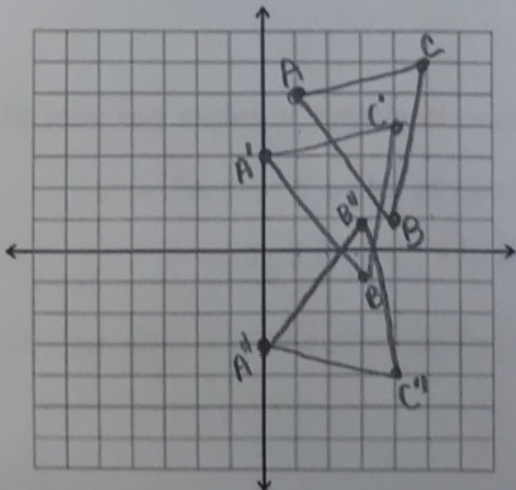14) Using the figure provided, write a translation rule for each of the following:

Figure 1 to 2: $(x,y) \rightarrow (x+4, y+2$
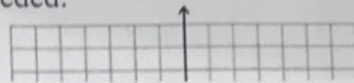
Figure 4 to 3: $(x,y) \rightarrow (x-3, y-3)$

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) -----> (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' $(0,3)$

B' $(3,-1)$

C' $(4,4)$

A" $(0,-3)$

B" $(3,1)$

C" $(4,-4)$

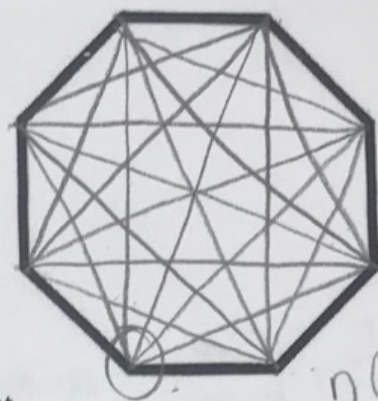What is the name of the shape on the right?

octagon

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

20

$$\frac{n(n-3)}{2}$$

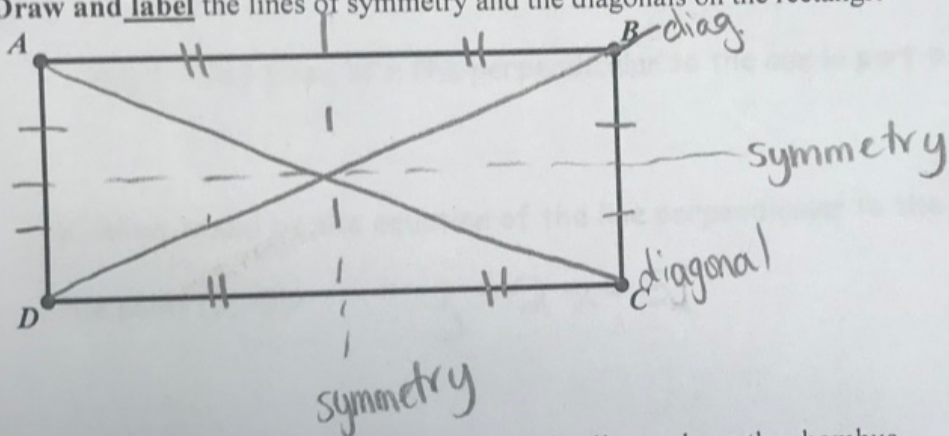18. How many lines of symmetry are there on the shape to the right?

8

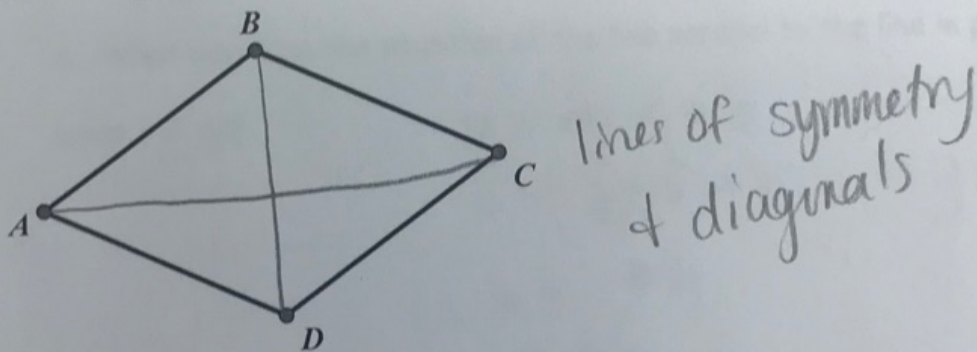19. List all of the degrees of rotational symmetry for the shape to the right.

$$\frac{360}{8} = 45$$

45, 90, 135, 180, 225, 270, 315, 360

$$\frac{n(n-3)}{2}$$

20. Draw and __label__ the lines of symmetry and the diagonals on the rectangle

A — B -diag.

symmetry

diagonal

symmetry

D — C

21. Draw and __label__ the lines of symmetry and the diagonals on the rhombus.

lines of symmetry
& diagonals

B

A

C

D

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

18

23. How many angles of rotational symmetry for a 36-sided regular polygon? __36__

$$\frac{360}{36} = 10$$

Give the first 5 angles of rotational symmetry.

10, 20, 30, 40, 50 . . .

...for an n-sided regular polygon? n

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).

$$\frac{4--3}{-10-4} = \frac{7}{-14} = -\frac{1}{2}$$

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

$-\frac{1}{2}$

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

2

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

$y = 2x - 5$

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

$y = mx + b$

$6 = (-\frac{1}{2})(-2) + b$

$6 = 1 + b$

$5 = b$

$y = -\frac{1}{2}x + 5$