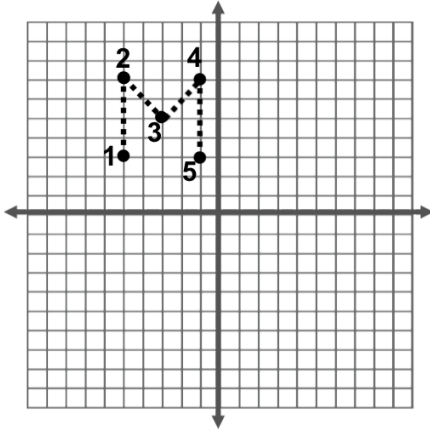


**LEVEL: EMERGING**

1) Directions: Rotate the image with the given angle of rotation about the origin.

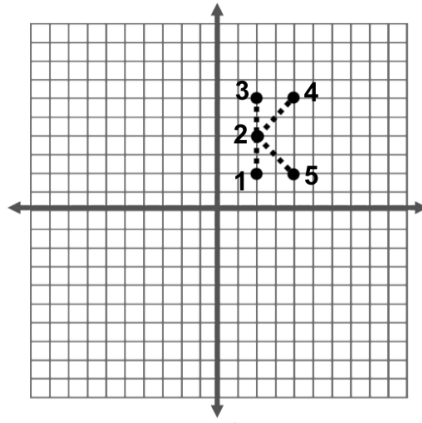
a) 180° Clockwise



Pre-image                      Image

- |          |           |
|----------|-----------|
| 1 (    ) | 1' (    ) |
| 2 (    ) | 2' (    ) |
| 3 (    ) | 3' (    ) |
| 4 (    ) | 4' (    ) |
| 5 (    ) | 5' (    ) |

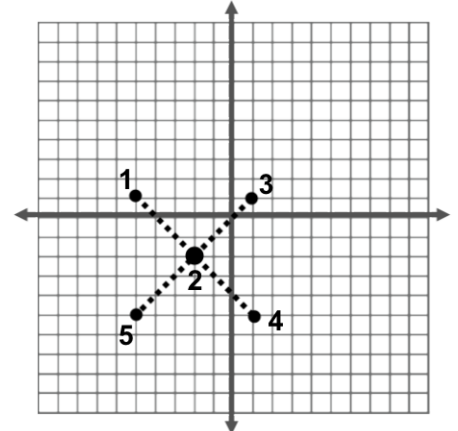
b) 90° Counterclockwise



Pre-image                      Image

- |          |           |
|----------|-----------|
| 1 (    ) | 1' (    ) |
| 2 (    ) | 2' (    ) |
| 3 (    ) | 3' (    ) |
| 4 (    ) | 4' (    ) |
| 5 (    ) | 5' (    ) |

c) 270° Counterclockwise



Pre-image                      Image

- |          |            |
|----------|------------|
| 1 (    ) | 1' (    )  |
| 2 (    ) | 2' (    )  |
| 3 (    ) | 3' (    )  |
| 4 (    ) | 4' (    )  |
| 5 (    ) | 5' (    )s |

**LEVEL: PROFICIENT**

2) Directions: Determine the coordinates of the indicated vertices of the triangle rotated 180° clockwise about the origin.

a) A(-7,9), B (9,-9) , C (6,7)

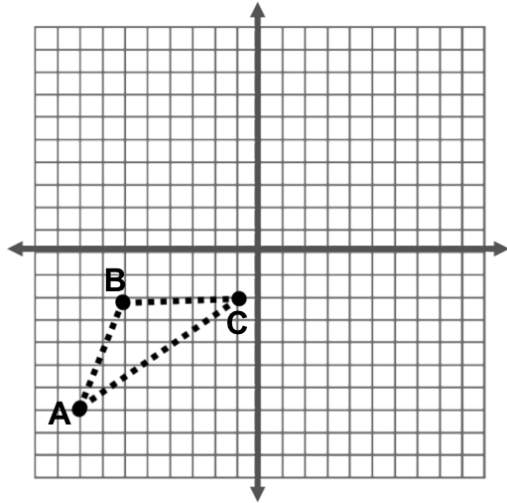
b) A(-3,5), B (5,-5) , C (0,7)

3) Directions: Determine the coordinates of the indicated vertices of the triangle rotated 90° counterclockwise about the origin.

a) A(-10,-8), B (-4,7) , C (-1,-6)

b) A(4,-6), B (-3,8) , C (-5,-4)

4) Directions: Sketch the resulting triangle after the indicated rotation about the origin. Then list the new vertices.



a) Rotation  $180^\circ$

$A'(\underline{\quad}, \underline{\quad})$   $B'(\underline{\quad}, \underline{\quad})$   $C'(\underline{\quad}, \underline{\quad})$

b)  $90^\circ$  clockwise

$A'(\underline{\quad}, \underline{\quad})$   $B'(\underline{\quad}, \underline{\quad})$   $C'(\underline{\quad}, \underline{\quad})$

c)  $90^\circ$  counterclockwise

$A'(\underline{\quad}, \underline{\quad})$   $B'(\underline{\quad}, \underline{\quad})$   $C'(\underline{\quad}, \underline{\quad})$

### LEVEL: MASTERY

5) Describe **in your own words** what a “rotation” is.

6) Describe **in your own words** what the “center of rotation” is.

7) Which of the following coordinates describes a  $180^\circ$  clockwise rotation of the point  $(-a, b)$  about the origin?

- (a)  $(-a, -b)$
- (b)  $(a, -b)$
- (c)  $(-a, b)$
- (d)  $(a, b)$

8) Which of the following coordinates describes a  $90^\circ$  counterclockwise rotation of the point  $(-a, b)$  about the origin?

- (a)  $(-a, -b)$
- (b)  $(-b, -a)$
- (c)  $(a, b)$
- (d)  $(b, a)$

9) Rotate  $\overline{ML}$   $90^\circ$  counterclockwise about the origin. The coordinates are  $M(-4, 2)$  and  $L(2, -7)$ . Which of the following statements are true.

- (a)  $M'$  will be located in quadrant III
- (b)  $L'$  will be located in quadrant II
- (c) The slope of  $\overline{M'L'}$  is positive
- (d) The slope of  $\overline{M'L'}$  is negative
- (e) All points are positive

10) A point  $B(-1, -2)$  is being rotated  $180^\circ$  clockwise about the origin. What are the coordinates of the image of  $B$ ?

$x$  – coordinate: \_\_\_\_\_  $y$  – coordinate: \_\_\_\_\_

Sum: \_\_\_\_\_

## Unit 2.2B Worksheet Answers

1.
  - a. Pre-image:  $1(-5,3), 2(-5,7), 3(-3,5), 4(-1,7), 5(-1,3) \rightarrow$   
Image:  $1'(5, -3), 2'(5, -7), 3'(3, -5), 4'(1, -7), 5'(1, -3)$
  - b. Pre-image:  $1(2,2), 2(2,4), 3(2,6), 4(4,6), 5(4,2) \rightarrow$   
Image:  $1'(-2,2), 2'(-4,2), 3'(-6,2), 4'(-6,4), 5'(-2,4)$
  - c. Pre-image:  $1(-5,1), 2(-2, -2), 3(1,1), 4(1, -5), 5(-5, -5) \rightarrow$   
Image:  $1'(1,5), 2'(-2,2), 3'(1, -1), 4'(-5, -1), 5'(-5,5)$
2.
  - a.  $A'(7, -9), B'(-9, -9), C'(-6,7)$
  - b.  $A'(3, -5), B'(-5,5), C'(0, -7)$
3.
  - a.  $A'(8, -10), B'(-7, -4), C'(6, -1)$
  - b.  $A'(6,4), B'(-8, -3), C'(4, -5)$
4.
  - a.  $A'(8,7), B'(6,2), C'(1,2)$
  - b.  $A'(-7,8), B'(-2,6), C'(-2,1)$
  - c.  $A'(7, -8), B'(2, -6), C'(2, -1)$
5. Answers may vary
6. Answers may vary
7. B
8. B
9. C
10. x-coordinate = 1 , y-coordinate = 2, sum = 3