

Name: \_\_\_\_\_

Unit 9: Transformations



Date: \_\_\_\_\_ Per: \_\_\_\_\_

Homework 3: Rotations (about the origin)

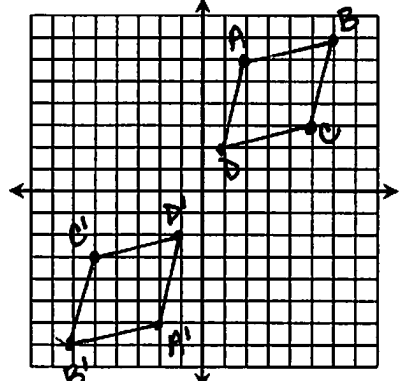
**\*\* This is a 2-page document! \*\***

**Directions:** Give each rule for counterclockwise rotations about the origin:

90°:  $(x, y) \rightarrow (-y, x)$       180°:  $(x, y) \rightarrow (-x, -y)$       270°:  $(x, y) \rightarrow (y, -x)$

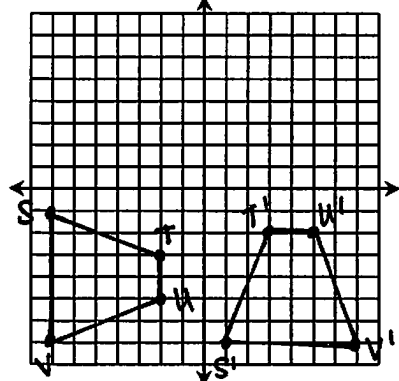
**Directions:** Graph and label each figure and its image under a rotation about the origin. Give the coordinates of the image.

1. Rhombus  $ABCD$  with vertices  $A(2, 6)$ ,  $B(6, 7)$ ,  $C(5, 3)$ , and  $D(1, 2)$ : 180°



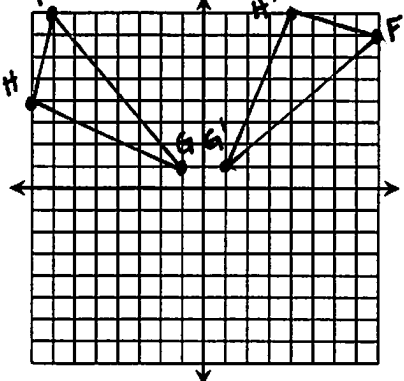
- $A'(-2, -6)$
- $B'(-6, -7)$
- $C'(-5, -3)$
- $D'(-1, -2)$

2. Trapezoid  $STUV$  with vertices  $S(-7, -1)$ ,  $T(-2, -3)$ ,  $U(-2, -5)$ , and  $V(-7, -7)$ : 90° counterclockwise



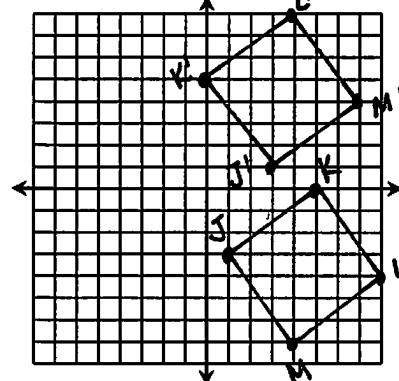
- $S'(1, -7)$
- $T'(3, -2)$
- $U'(5, -2)$
- $V'(7, -7)$

3. Triangle  $FGH$  with vertices  $F(-7, 8)$ ,  $G(-1, 1)$ , and  $H(-8, 4)$ : 270° counterclockwise



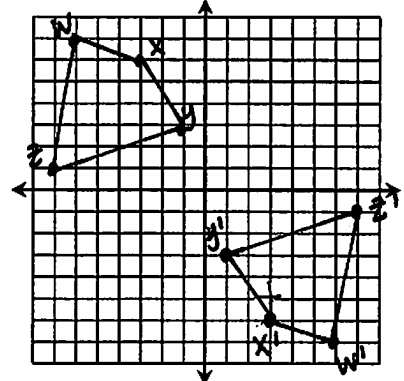
- $F'(8, 7)$
- $G'(1, 1)$
- $H'(4, 8)$

4. Square  $JKLM$  with vertices  $J(1, -3)$ ,  $K(5, 0)$ ,  $L(8, -4)$ , and  $M(4, -7)$ : 90° counterclockwise



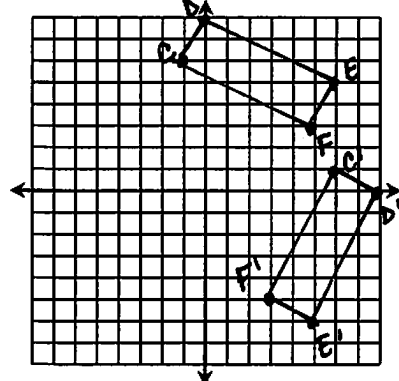
- $J'(3, 1)$
- $K'(0, 5)$
- $L'(4, 8)$
- $M'(7, 4)$

5. Quadrilateral  $WXYZ$  with vertices  $W(-6, 7)$ ,  $X(-3, 6)$ ,  $Y(-1, 3)$ , and  $Z(-7, 1)$ : 180°



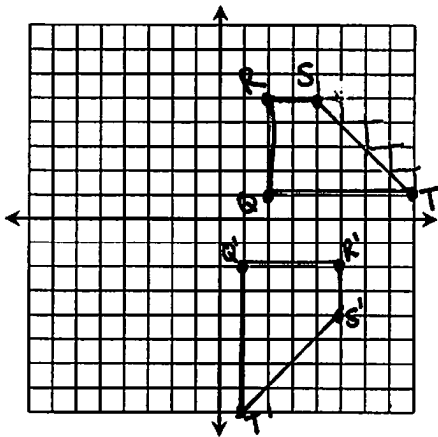
- $W'(6, -7)$
- $X'(3, -6)$
- $Y'(1, -3)$
- $Z'(7, -1)$

6. Rectangle  $CDEF$  with vertices  $C(-1, 6)$ ,  $D(0, 8)$ ,  $E(6, 5)$ , and  $F(5, 3)$ : 270° counterclockwise



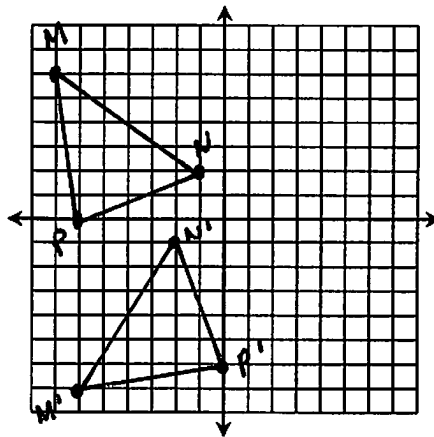
- $C'(6, 1)$
- $D'(8, 0)$
- $E'(5, -6)$
- $F'(3, -5)$

7. Trapezoid  $QRST$  with vertices  $Q(2, 1)$ ,  $R(2, 5)$ ,  $S(4, 5)$ , and  $T(8, 1)$ :  $90^\circ$  clockwise ( $270^\circ$  CCW)



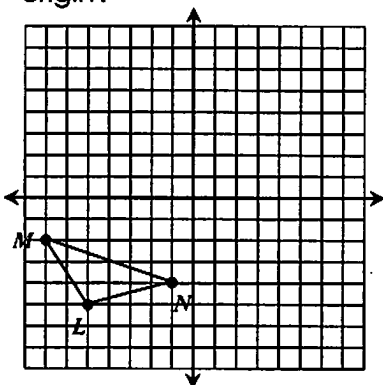
$Q'(\underline{1}, \underline{-2})$   
 $R'(\underline{5}, \underline{-2})$   
 $S'(\underline{5}, \underline{-4})$   
 $T'(\underline{1}, \underline{-8})$

8. Triangle  $MNP$  with vertices  $M(-7, 6)$ ,  $N(-1, 2)$ , and  $P(-6, 0)$ :  $270^\circ$  clockwise ( $90^\circ$  CCW)



$M'(\underline{-6}, \underline{-7})$   
 $N'(\underline{-2}, \underline{-1})$   
 $P'(\underline{0}, \underline{-6})$

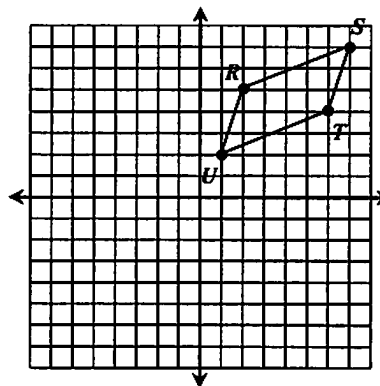
9. What will be the coordinates of point  $N$  after a  $270^\circ$  counterclockwise rotation about the origin?



$N(-1, 4)$

$N'(\underline{-4}, \underline{1})$

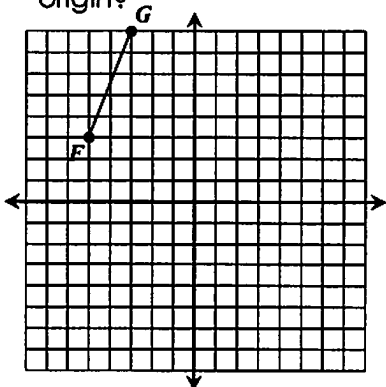
10. What will be the coordinates of point  $T$  after a  $180^\circ$  rotation about the origin?



$T(3, 2)$

$T'(\underline{-3}, \underline{-2})$

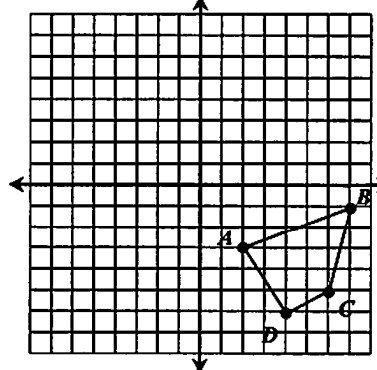
11. What will be the coordinates of point  $G$  after a  $90^\circ$  counterclockwise rotation about the origin?



$G(-3, 1)$

$G'(\underline{-8}, \underline{-3})$

12. What will be the coordinates of point  $A$  after a  $90^\circ$  clockwise rotation about the origin? ( $270^\circ$  CCW)



$A(2, -3)$

$A'(\underline{-3}, \underline{-2})$

13.  $P'(8, -2)$  is the image of  $P$  after a  $180^\circ$  rotation about the origin. What are the coordinates of  $P$ ?

$P(\underline{-8}, \underline{2})$

14.  $M'(-5, -4)$  is the image of  $M$  after a  $90^\circ$  counterclockwise rotation about the origin. What are the coordinates of  $M$ ?

$M(\underline{-4}, \underline{5})$