

# Transformations – Rotations

G.CO.A.5

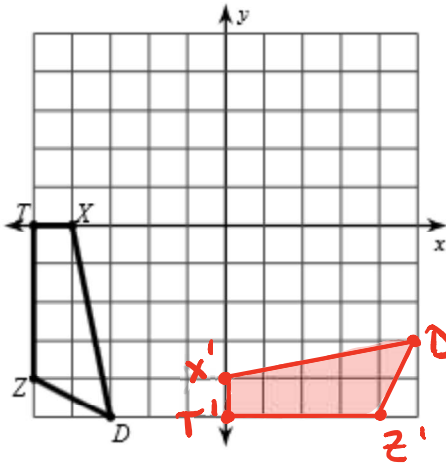
Hw Section 20.3

Name \_\_\_\_\_

**Graph and label the image of the figure using the transformation given.**

1) rotation  $90^\circ$  counterclockwise about the origin

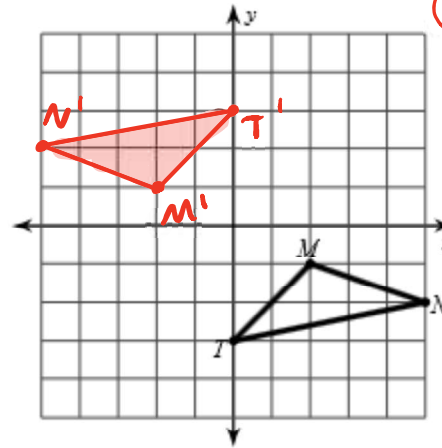
$$(x, y) \rightarrow (-y, x)$$



$T(-5, 0)$ $T'(0, -5)$
$X(-4, 0)$ $X'(0, -4)$
$D(-3, -5)$ $D'(4, -5)$
$Z(-5, -4)$ $Z'(4, -5)$

2) rotation  $180^\circ$  about the origin

$$(x, y) \rightarrow (-x, -y)$$



$M(2, -1)$ $M'(-2, 1)$
$N(5, -2)$ $N'(-5, 2)$
$T(0, -3)$ $T'(0, 3)$

**Find the coordinates of the vertices of each figure after the given transformation.**

3) rotation  ~~$90^\circ$~~   <sup>$270^\circ$  ccw</sup> clockwise about the origin  
 $G(0, -3), B(3, -1), U(1, -5)$

$$G'(-3, 0), B'(-1, -3), U'(-5, -1)$$

4) rotation  $90^\circ$  clockwise about the origin  
 $R(1, 1), F(5, 4), H(3, 1)$

$$R'(1, -1), F'(4, -5), H'(1, -3)$$

$$(x, y)$$

$$90 \text{ ccw } (-y, x)$$

$$180 \text{ ccw } (-x, -y)$$

$$270 \text{ ccw } (y, -x)$$

5) rotation  $180^\circ$  about the origin  
 $I(1, 3), F(5, 5), C(4, 2)$

$$I'(-1, -3), F'(-5, -5), C'(-4, -2)$$

6) rotation  $90^\circ$  counterclockwise about the origin  
 $I(-5, 1), X(-4, 5), Q(-2, 0)$

$$I'(-1, -5), X'(-5, -4), Q'(0, -2)$$

# Transformations – Rotations

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Hw Section 20.3

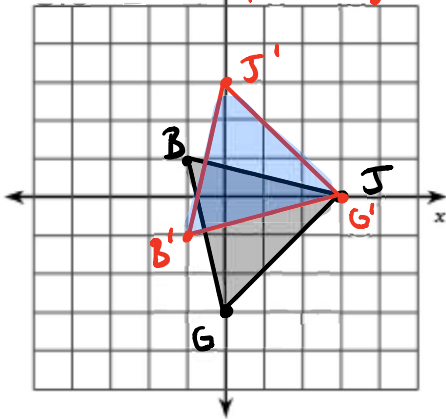
Name \_\_\_\_\_

**Graph the image and the preimage of the figure using the transformation given.**

7) rotation  $90^\circ$  counterclockwise about the origin

$G(0, -3), B(-1, 1), J(3, 0)$

$G'(3, 0), B'(-1, -1), J'(0, 3)$

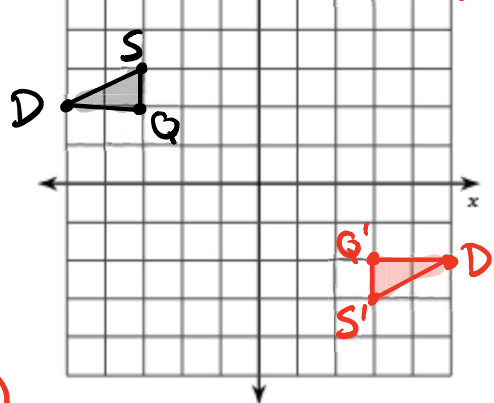


$(x, y)$   
 $90^\circ \text{ ccw } (-y, x)$   
 $180^\circ \text{ ccw } (-x, -y)$   
 $270^\circ \text{ ccw } (y, -x)$

8) rotation  $180^\circ$  about the origin

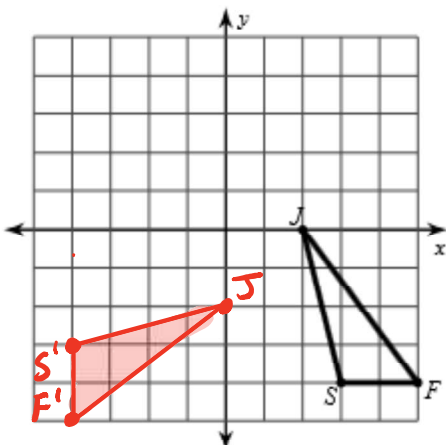
$D(-5, 2), S(-3, 3), Q(-3, 2)$

$D'(5, -2), S'(3, -3), Q'(3, -2)$

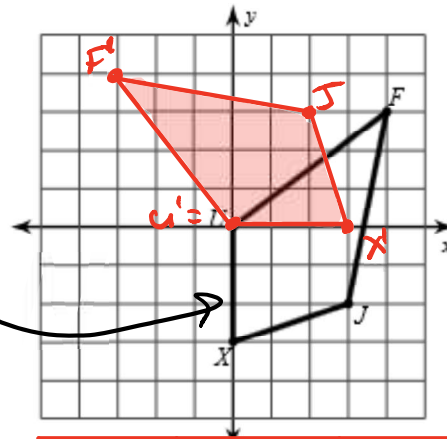


**Graph the image and the preimage of the figure using the transformation given.**

9) rotation  ~~$90^\circ$  clockwise~~  <sup>$270^\circ$  ccw</sup> about the origin



10) rotation  $90^\circ$  counterclockwise about the origin



$J(2, 0)$	$S(3, -4)$	$F(5, -4)$
$J'(0, -2)$	$S'(-4, -3)$	$F'(-4, -5)$

$X(0, 0)$	$X(0, -3)$	$F(4, 3)$	$J(3, -2)$
$X'(0, 0)$	$X'(3, 0)$	$F'(-3, 4)$	$J'(2, 3)$

# Transformations – Rotations

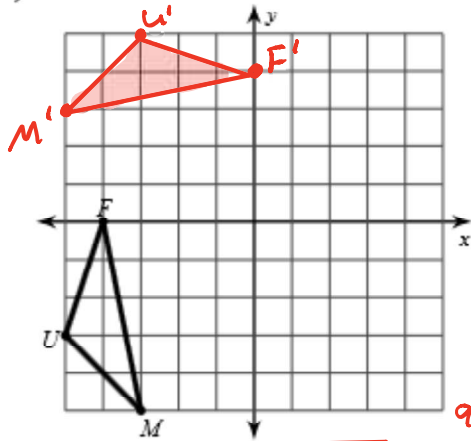
G.CO.A.5

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Name \_\_\_\_\_

Find the coordinates of the vertices of each figure after the given transformation. Then graph the reflection.

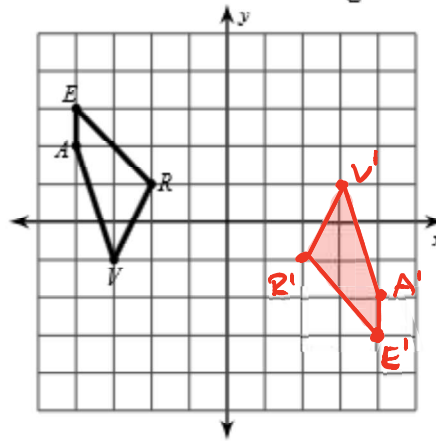
11) rotation ~~90° clockwise~~ <sup>270° ccw</sup> about the origin



$F(-4, 0)$	$M(-3, -5)$	$U(-5, -3)$
$F'(0, 4)$	$M'(-5, 3)$	$U'(-3, 5)$

$(x, y)$   
 90 ccw  $(-y, x)$   
 180 ccw  $(-x, -y)$   
 270 ccw  $(y, -x)$

12) rotation 180° about the origin



$E(-4, 3)$
$E'(4, -3)$
$A(-4, 2)$
$A'(4, -2)$
$V(-3, -1)$
$V'(3, 1)$
$R(-2, 1)$
$R'(2, -1)$

13) rotation 90° counterclockwise about the origin

$U(2, -4), I(0, -1), C(2, -1), E(5, -3)$

$U'(4, 2), I'(1, 0), C'(1, 2), E'(3, 5)$

14) rotation 180° about the origin

$F(4, -3), D(3, 0), V(5, 0), E(5, -4)$

$F'(-4, 3), D'(-3, 0), V'(-5, 0), E'(-5, 4)$

# Transformations – Rotations

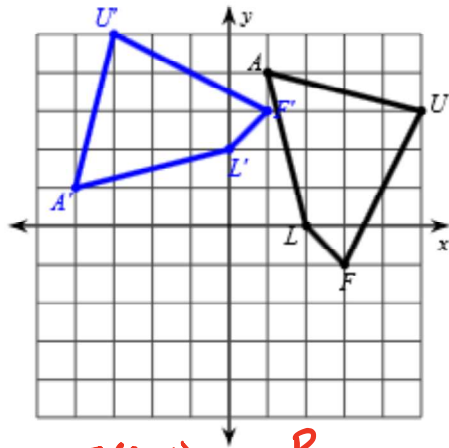
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Hw Section 20.3

Name \_\_\_\_\_

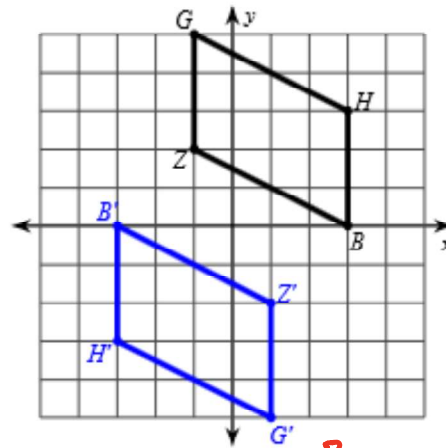
**Tell the type of rotation that describes each transformation.**

15)



$F(3, -1)$        $R_{0, 90^\circ}$   
 $F'(1, 3)$

16)



$R_{0, 180^\circ}$

17)  $F(1, 0), N(1, 3), V(2, 4), U(3, 4)$   
 to  
 $F'(-1, 0), N'(-1, -3), V'(-2, -4), U'(-3, -4)$   
 $(x, y) \rightarrow (-x, -y)$

$R_{0, 180^\circ}$

18)  $Q(-3, 1), A(-4, 3), I(-2, 4), E(0, 4)$   
 to  
 $Q'(1, 3), A'(3, 4), I'(4, 2), E'(4, 0)$   
 $(x, y) \rightarrow (y, -x)$

$R_{0, 270^\circ}$