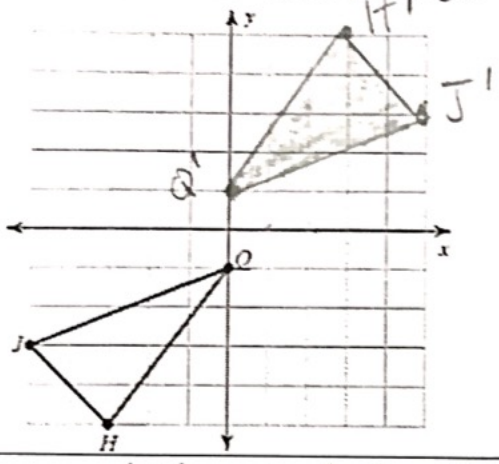
90° clockwise $(x, y) \rightarrow (y, -x)$	90° counterclockwise $(x, y) \rightarrow (-y, x)$	180° $(x, y) \rightarrow (-x, -y)$

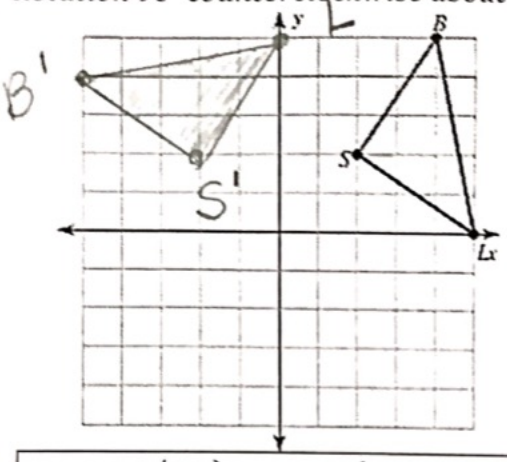
Graph the image of the figure using the transformation given. Find the coordinates of the shaded image.

1. *Rotation 180° about the origin*



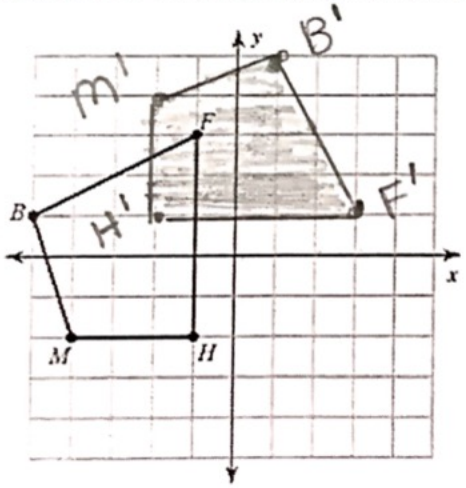
(x, y) →	$(-x, -y)$
J (-5, -3)	J' (5, 3)
H (-3, -5)	H' (3, 5)
Q (0, -1)	Q' (0, 1)

2. *Rotation 90° counterclockwise about the origi*



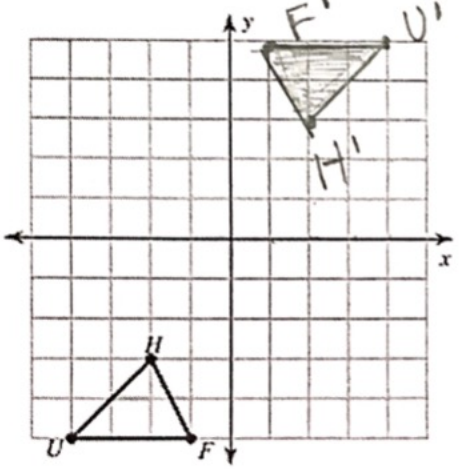
(x, y) →	$(-y, x)$
B (4, 5)	B' (-5, 4)
L (5, 0)	L' (0, 5)
S (2, 2)	S' (-2, 2)

3. *Rotation 90° clockwise about the origin*



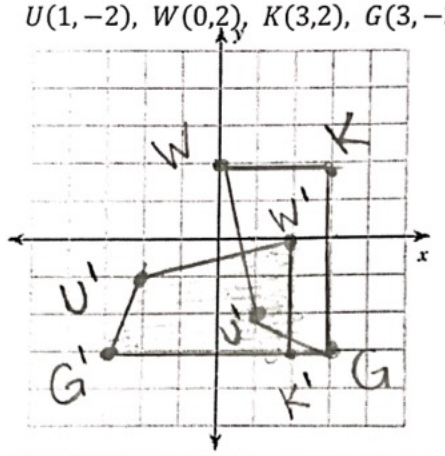
(x, y) →	$(y, -x)$
B (-5, 1)	B' (1, 5)
F (-1, 3)	F' (3, 1)
H (-1, -2)	H' (-2, 1)
m (-4, -2	M' (-2, 4)

4. *Rotation 180° about the origin*



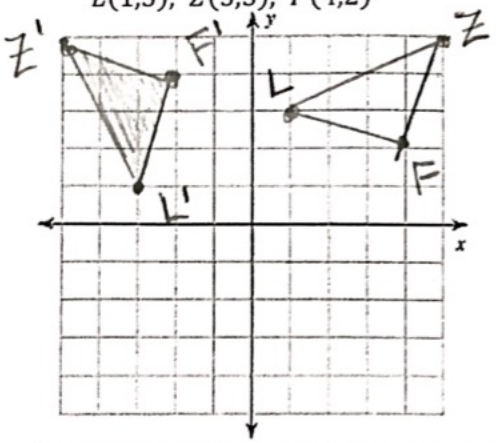
(x, y) →	$(-x, -y)$
F (-1, -5)	F' (1, 5)
H (-2, -3)	H' (2, 3)
U (-4, -5	U' (4, 5)

5. *Rotation 90° clockwise about the origin*
$U(1,-2)$, $W(0,2)$, $K(3,2)$, $G(3,-3)$



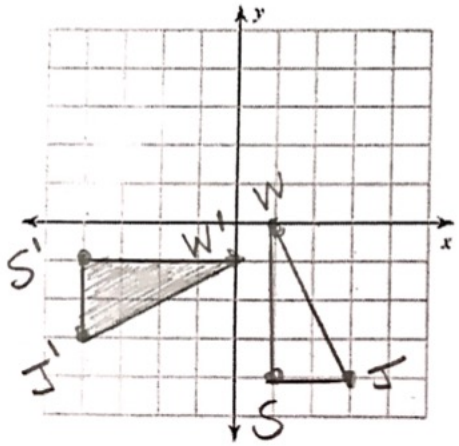
(x,y) →	$(y,-x)$
U (1, −2)	U' (−2, −1)
W (0, 2)	W' (2, 0)
K (3, 2)	K' (2, −3)
G (3, −3)	G' (−3, −3)

6. *Rotation 90° counterclockwise about the origin*
$L(1,3)$, $Z(5,5)$, $F(4,2)$



(x,y) →	$(-y,x)$
L (1, 3)	L' (−3, 1)
Z (5, 5)	Z' (−5, 5)
F (4, 2)	F' (−2, 4)

7. *Rotation 90° clockwise about the origin*
$S(1,-4)$, $W(1,0)$, $J(3.-4)$



(x,y) →	$(y,-x)$
S (1, −4)	S' (−4, −1)
W (1, 0)	W' (0, −1)
J (3, −4)	J' (−4, −3)

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

8. *Rotation 180° about the origin*

$Z(-1,-5)$, $K(-1,0)$, $C(1,1)$, $N(3,-2)$

$(-x,-y)$

Z' (1, 5) C' (−1, −1)

K' (1, 0) N (−3, 2)

9. *Rotation 90° clockwise about the origin*

$A(-4,-5)$, $B(2,-2)$, $C(-3,0)$

$(y,-x)$

A' (−5, 4) C' (0, 3)

B' (−2, −2)

10. *Rotation 90° counterclockwise about the origin*

$V(-5,-3)$, $A(-3,1)$, $G(0,-3)$

$(-y,x)$

W' (3, −5)

A' (−1, −3)