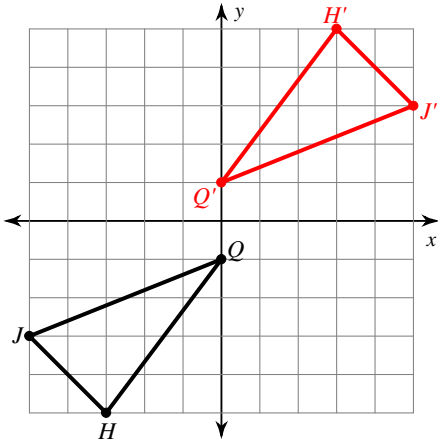


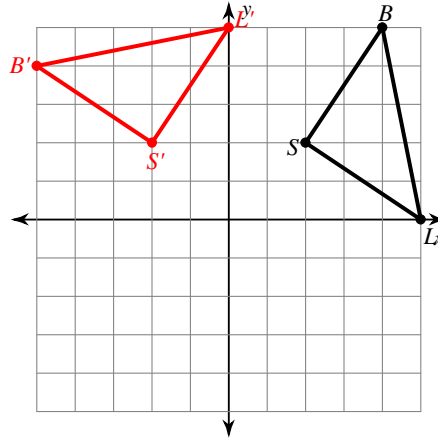
# Rotations of Shapes

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

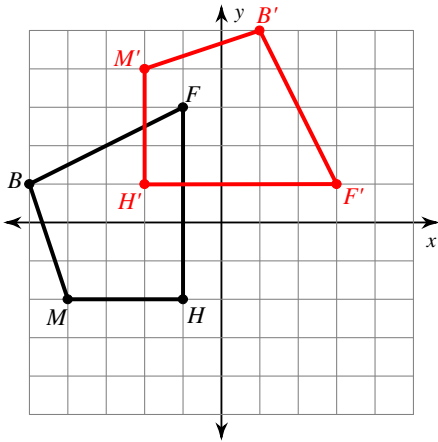
1) rotation  $180^\circ$  about the origin



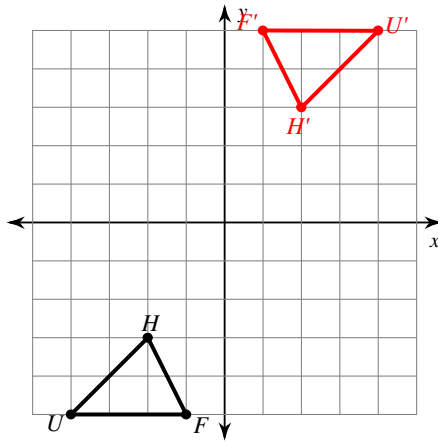
2) rotation  $90^\circ$  counterclockwise about the origin



3) rotation  $90^\circ$  clockwise about the origin

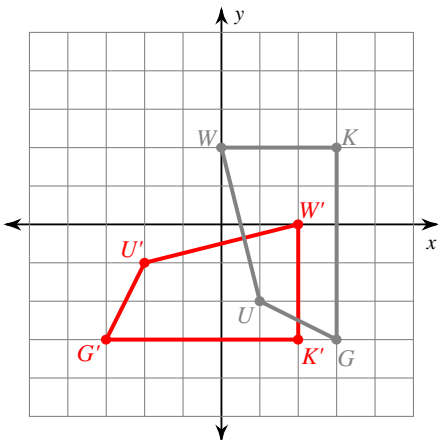


4) rotation  $180^\circ$  about the origin



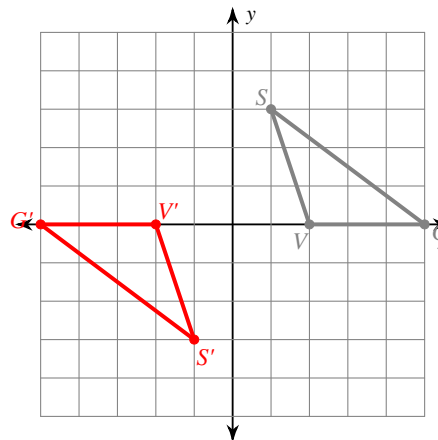
5) rotation  $90^\circ$  clockwise about the origin

$U(1, -2), W(0, 2), K(3, 2), G(3, -3)$



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

$V(2, 0), S(1, 3), G(5, 0)$



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

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

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

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

9) rotation  $90^\circ$  clockwise about the origin

$S(1, -4), W(1, 0), J(3, -4)$

$S'(-4, -1), W'(0, -1), J'(-4, -3)$

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

$L(1, 3), Z(5, 5), F(4, 2)$

$L'(-1, -3), Z'(-5, -5), F'(-4, -2)$

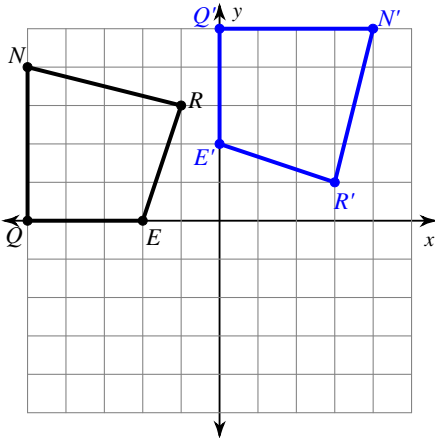
10) rotation  $180^\circ$  about the origin

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

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

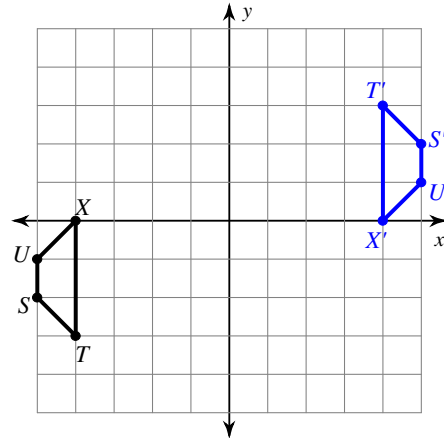
**Write a rule to describe each transformation.**

11)



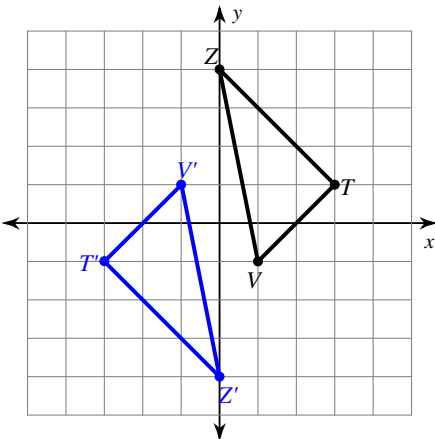
rotation  $90^\circ$  clockwise about the origin

12)



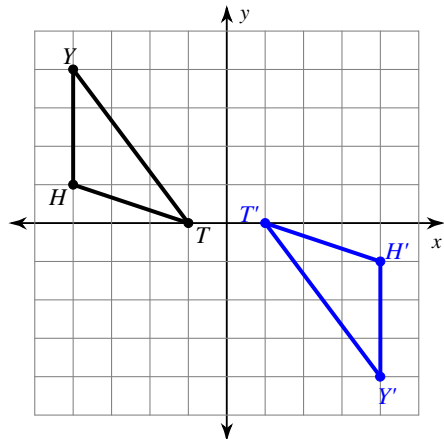
rotation  $180^\circ$  about the origin

13)



rotation  $180^\circ$  about the origin

14)



rotation  $180^\circ$  about the origin