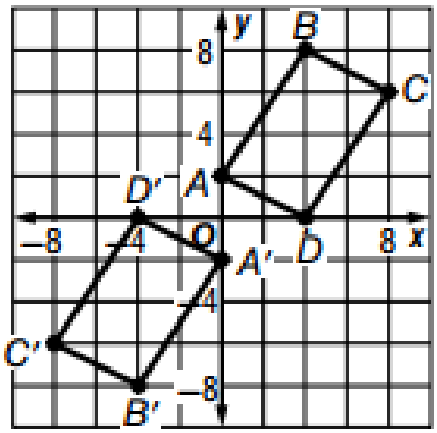
MULTIPLE CHOICE For the transformation shown, what is the measure of the angle of rotation of *ABCD* about the origin?



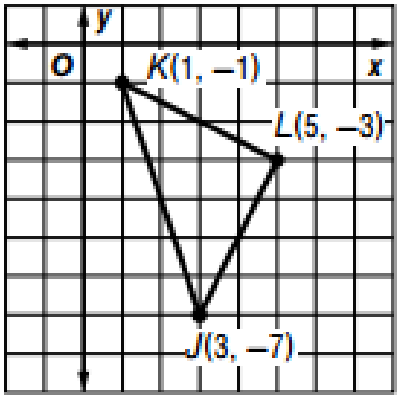
A 90°

B 180°

C 270°

D 360°

Triangle *JKL* is shown at the right. What is the image of point *J* after a rotation 270° counterclockwise about the origin?



A (−3, −7)

B (−7, 3)

C (−7, −3)

D (7, −3)

Key Concept — Rotations in the Coordinate Plane

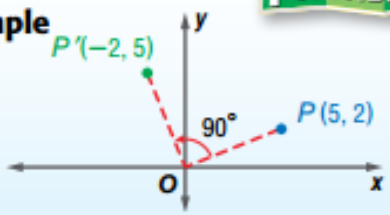
For Your FOLDABLE

90° Rotation

To rotate a point 90° counterclockwise about the origin, multiply the *y*-coordinate by −1 and then interchange the *x*- and *y*-coordinates.

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

Example

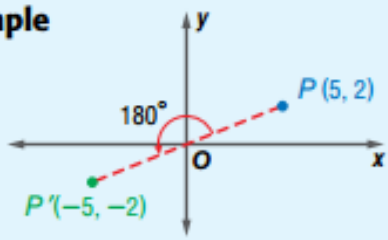


180° Rotation

To rotate a point 180° counterclockwise about the origin, multiply the *x*- and *y*-coordinates by −1.

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

Example

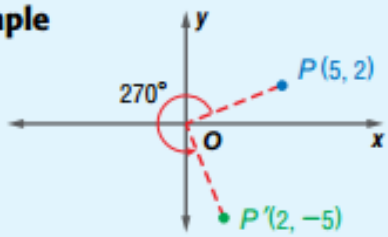


270° Rotation

To rotate a point 270° counterclockwise about the origin, multiply the *x*-coordinate by −1 and then interchange the *x*- and *y*-coordinates.

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

Example



:aph each figure and its image after the specified rotation about the origin.

. $\triangle JKL$ has vertices $J(2, 6)$, $K(5, 2)$, and $L(7, 5)$; 90°

. rhombus $WXYZ$ has vertices $W(-3, 4)$, $X(0, 7)$, $Y(3, 4)$, and $Z(0, 1)$; 90°

. $\triangle FGH$ has vertices $F(2, 4)$, $G(5, 6)$, and $H(7, 2)$; 180°

. trapezoid $ABCD$ has vertices $A(-7, -2)$, $B(-6, -6)$, $C(-1, -1)$, and $D(-5, 0)$; 180°

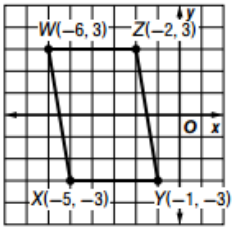
. $\triangle RST$ has vertices $R(-6, -1)$, $S(-4, -5)$, and $T(-2, -1)$; 270°

. parallelogram $MPQV$ has vertices $M(-6, 3)$, $P(-2, 3)$, $Q(-3, -2)$, and $V(-7, -2)$; 270°

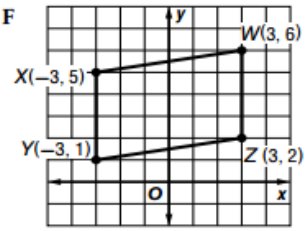
Triangle DFG has vertices $D(-2, 6)$, $F(2, 8)$, and $G(2, 3)$. Graph $\triangle DFG$ and its image after a rotation 180° about the origin.

Check Your Progress

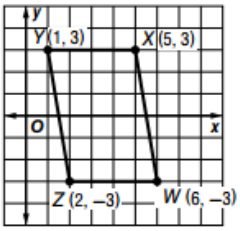
3. Parallelogram $WXYZ$ is rotated 180° counterclockwise about the origin. Which of these graphs represents the resulting image?



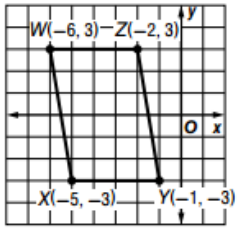
F



H



G



J