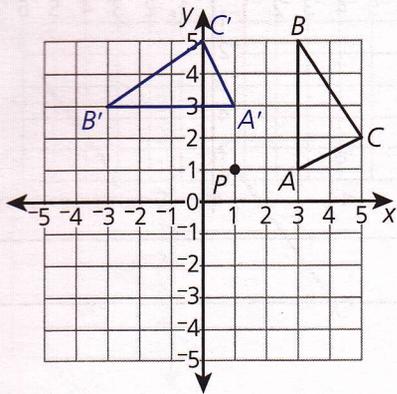


A **rotation** (or **turn**) is a movement of a geometric figure in a circular arc **around** or **about** a certain point. A rotation moves **clockwise** or **counterclockwise** a certain number of degrees.



This rotation can be written as  $R_{P, -90^\circ}(\triangle ABC) = \triangle A'B'C'$ . Each vertex of  $\triangle ABC$  rotates  $90^\circ$  clockwise to become the corresponding vertex of  $\triangle A'B'C'$ .

A clockwise rotation is negative.

A counterclockwise rotation is positive.

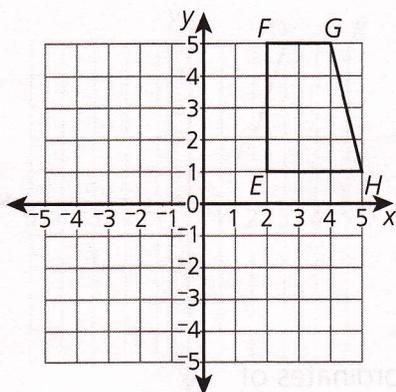
Rotation notation:

$$R_{P, 90^\circ}(F) = F'$$

Figure  $F$  is rotated  $90^\circ$  to the left (counterclockwise) about point  $P$  to make figure  $F'$ .

Read each problem. Circle the letter of the best answer.

Use this diagram to answer questions 1 and 2.



1 If  $R_{(0, 0), 180^\circ}(EFGH) = E'F'G'H'$ , what are the coordinates of point  $F'$ ?

- A (-5, -2)                      C (-2, -5)
- B (-5, 2)                        D (5, -2)

The rotation notation says that  $E'F'G'H'$  is the image of  $EFGH$  under a rotation  $180^\circ$  to the left around the origin  $(0, 0)$ . So each point of  $EFGH$  moves to a corresponding point in the third quadrant, and  $F'$  is at  $(-2, -5)$ . The correct answer is C.

2 Which rotation of  $EFGH$  would result in point  $H'$  being located at  $(2, -2)$ ?

- A  $R_{E, -90^\circ}(EFGH) = E'F'G'H'$
- B  $R_{E, -45^\circ}(EFGH) = E'F'G'H'$
- C  $R_{E, 90^\circ}(EFGH) = E'F'G'H'$
- D  $R_{E, 180^\circ}(EFGH) = E'F'G'H'$

$\triangle JKL$  has vertices  $J(-5, 2)$ ,  $K(-2, 6)$ , and  $L(-2, 2)$ .  $\triangle JKL$  will be rotated  $90^\circ$  counterclockwise about the origin to produce  $\triangle J'K'L'$ . Use this information to answer questions 3 and 4.

3 What will be the coordinates of  $J'$ ?

- A (-5, -2)                      C (-2, -5)
- B (-3, -4)                        D (-1, -6)

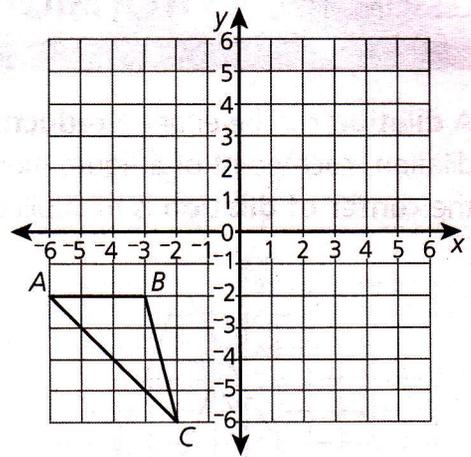
4 Which statement is **not** true?

- A  $L'$  will have coordinates  $(-2, -2)$ .
- B  $\triangle JKL$  and  $\triangle J'K'L'$  will be congruent.
- C  $\angle K$  and  $\angle K'$  will have equal measures.
- D  $\overline{JK}$  and  $\overline{K'L'}$  will have the same length.

Read each problem. Write your answers.

5 Look at  $\triangle ABC$  on the coordinate plane.

- A On the plane, draw  $\triangle A'B'C'$ , the image of  $\triangle ABC$  under a rotation  $180^\circ$  counterclockwise.
- B If  $\triangle ABC$  were rotated  $180^\circ$  clockwise instead of  $180^\circ$  counterclockwise, would the result be any different? Explain why or why not.




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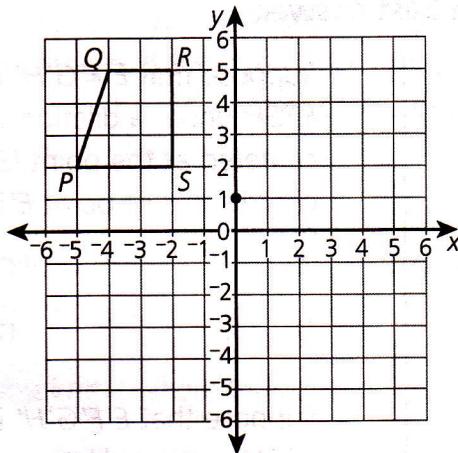


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6 Look at  $PQRS$  on this coordinate plane.



- A On the plane, draw  $P'Q'R'S'$ , the image of  $PQRS$  under a  $90^\circ$  rotation clockwise about the point  $(0, 1)$ .
- B Now draw  $P''Q''R''S''$ , the image of  $P'Q'R'S'$  under another  $90^\circ$  rotation clockwise about the point  $(0, 1)$ .
- C Describe a rotation that would move  $PQRS$  to  $P''Q''R''S''$  in a single step.

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