

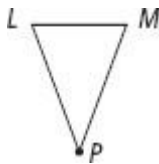
## Rotations

Copy each figure and point  $P$ . Draw the image of each figure for the given rotation about  $P$ . Use prime notation to label the vertices of the image.



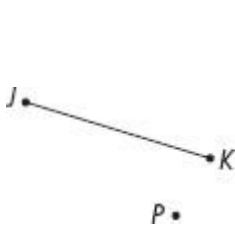
2.  $90^\circ$

$\bullet P$



4.  $180^\circ$

Copy each figure and point  $P$ . Then draw the image of  $\overline{JK}$  for a  $180^\circ$  rotation about  $P$ . Use prime notation to label the vertices of the image.



5.

$\bullet P$



6.

$\bullet P$

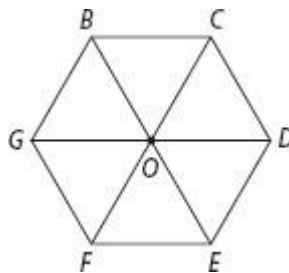
Point  $O$  is the center of regular hexagon  $BCDEFG$ . Find the image of the given point or segment for the given rotation.

7.  $r_{(120^\circ, O)}(F)$

8.  $r_{(180^\circ, O)}(B)$

9.  $r_{(300^\circ, O)}(\overline{BG})$

10.  $r_{(360^\circ, O)}(\overline{CD})$

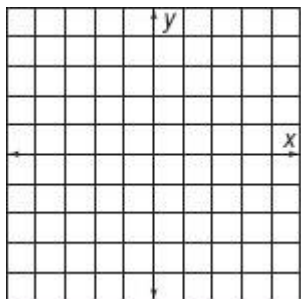


11.  $r_{(60^\circ, O)}(E)$

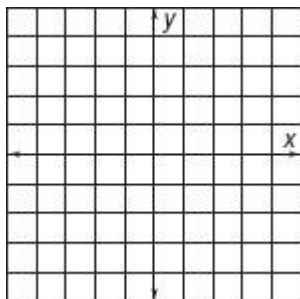
12.  $r_{(240^\circ, O)}(FE)$

For Exercises 13–15,  $\triangle ABC$  has vertices  $A(2, 2)$ ,  $B(3, -2)$ , and  $C(-1, 3)$ .

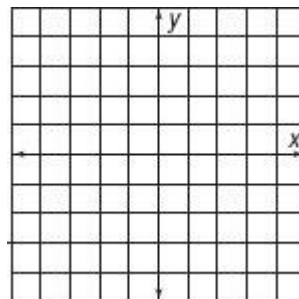
13. Graph  $r_{(90^\circ, O)}(\triangle ABC)$ .



14. Graph  $r_{(180^\circ, O)}(\triangle ABC)$ .



15. Graph  $r_{(270^\circ, O)}(\triangle ABC)$ .



16. The vertices of  $PQRS$  have coordinates  $P(-1, 5)$ ,  $Q(3, 4)$ ,  $R(2, -4)$ , and  $S(-3, -2)$ . What are the coordinates of the vertices of  $r_{(270^\circ, O)}(PQRS)$ ?

17. The vertices of  $r_{(90^\circ, O)}(KLMN)$  have coordinates  $K'(-3, 2)$ ,  $L'(2, 3)$ ,  $M'(4, -2)$ , and  $N'(-2, -4)$ . What are the coordinates of the vertices of  $KLMN$ ?

21. A pie is cut into 12 equal slices. What is the angle of rotation about the center that will map a piece of pie to a piece that is two slices away from it?

23.  $\triangle FGH$  has vertices  $F(-1, 2)$ ,  $G(0, 0)$ , and  $H(3, -1)$ . What are the coordinates of the vertices of  $r_{(-90^\circ, G)}(\triangle FGH)$ ?

