

9-3

Practice

Form G

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.

1. 60°



$\bullet P$

2. 90°



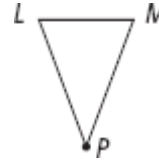
$\bullet P$

3. 120°



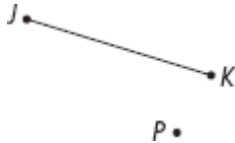
$\bullet P$

4. 180°

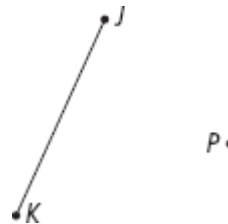


Copy each figure and point P . Then draw the image of \overline{JK} for a 180° rotation about P . Use prime notation to label the vertices of the image.

5.



6.



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

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

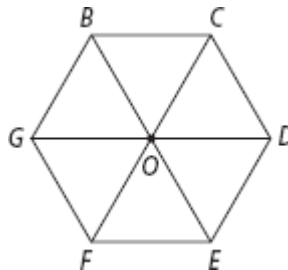
8. $r_{(180^\circ, O)}(B)$

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

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

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

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



9-3

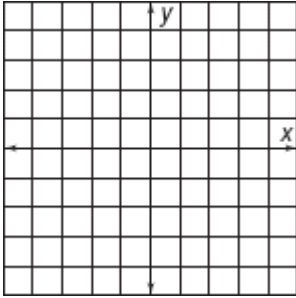
Practice (continued)

Form G

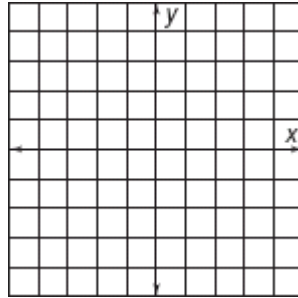
Rotations

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

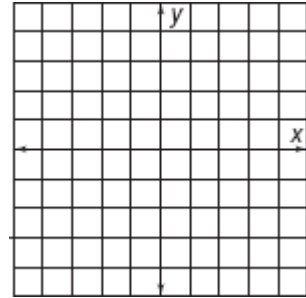
13. Graph $r_{(90^\circ, o)}(\triangle ABC)$.



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



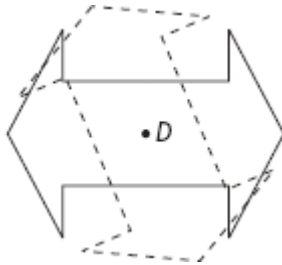
15. Graph $r_{(270^\circ, o)}(\triangle ABC)$.



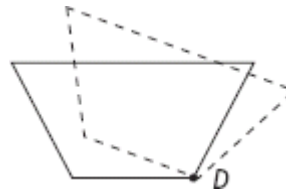
16. The vertices of $PQRS$ have coordinates $P(-1, 5)$, $Q(3, 4)$, $R(2, -4)$, and $S(-3, -2)$. What are the coordinates of the vertices of $r_{(270^\circ, o)}(PQRS)$?
17. The vertices of $r_{(90^\circ, o)}(KLMN)$ have coordinates $K'(-3, 2)$, $L'(2, 3)$, $M'(4, -2)$, and $N'(-2, -4)$. What are the coordinates of the vertices of $KLMN$?
18. **Reasoning** The vertices of quadrilateral $ABCD$ have coordinates $A(4, 3)$, $B(-3, 4)$, $C(-4, -3)$, and $D(3, -4)$. Explain how the transformation $r_{(90^\circ, o)}(ABCD) = BCDA$ can be used to show that the quadrilateral is square.

Find the angle of rotation about D that maps the solid-line figure to the dashed-line figure.

19.



20.



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?
22. $\triangle RST$ has vertices at $R(0, 3)$, $S(4, 0)$, and $T(0, 0)$. What are the coordinates of the vertices of $r_{(-90^\circ, T)}(\triangle RST)$?
23. $\triangle FGH$ has vertices $F(-1, 2)$, $G(0, 0)$, and $H(3, -1)$. What are the coordinates of the vertices of $r_{(-90^\circ, G)}(\triangle FGH)$?