

**Practice
Your Skills**

EXERCISES

1. In the photos below, identify the physical models that represent a circle, a radius, a chord, a tangent, and an arc of a circle.



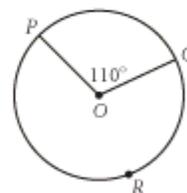
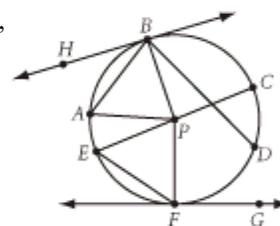
Circular irrigation on a farm



Japanese wood bridge

For Exercises 2–9, use the diagram at right. Points E , P , and C are collinear, and P is the center of the circle.

2. Name three chords.
 3. Name one diameter.
 4. Name five radii.
 5. Name five minor arcs.
 6. Name two semicircles.
 7. Name two major arcs.
 8. Name two tangents.
 9. Name a point of tangency.
10. Name two types of vehicles that use wheels, two household appliances that use wheels, and two uses of the wheel in the world of entertainment.
11. In the figure at right, what is $m\widehat{PQ}$? $m\widehat{PRQ}$?
12. Use your compass and protractor to make an arc with measure 65° . Now make an arc with measure 215° . Label each arc with its measure.
13. Name two places or objects where concentric circles appear. Bring an example of a set of concentric circles to class tomorrow. You might look in a magazine for a photo or make a copy of a photo from a book (but not this book!).
14. Sketch two circles that appear to be concentric. Then use your compass to construct a pair of concentric circles.
15. Sketch circle P . Sketch a triangle inside circle P so that the three sides of the triangle are chords of the circle. This triangle is “inscribed” in the circle. Sketch another circle and label it Q . Sketch a triangle in the exterior of circle Q so that the three sides of the triangle are tangents of the circle. This triangle is “circumscribed” about the circle.



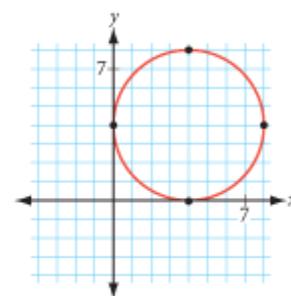
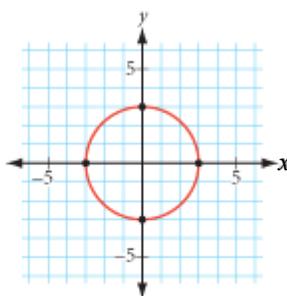
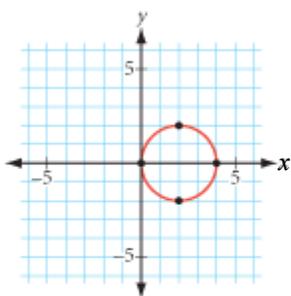
16. Use your compass to construct two circles with the same radius intersecting at two points. Label the centers P and Q . Label the points of intersection of the two circles A and B . Construct quadrilateral $PAQB$. What type of quadrilateral is it?
17. Do you remember the daisy construction from Chapter 0? Construct a circle with radius s . With the same compass setting, divide the circle into six congruent arcs. Construct the chords to form a regular hexagon inscribed in the circle. Construct radii to each of the six vertices. What type of triangle is formed? What is the ratio of the perimeter of the hexagon to the diameter of the circle?
18. Sketch the path made by the midpoint of a radius of a circle if the radius is rotated about the center.

For Exercises 19–21, use the ordered pair rule shown to relocate the four points on the given circle. Can the four new points be connected to create a new circle? Does the new figure appear congruent to the original circle?

19. $(x, y) \rightarrow (x - 1, y + 2)$

20. $(x, y) \rightarrow (2x, 2y)$ 

21. $(x, y) \rightarrow (2x, y)$



Review

22. If point D is in the interior of $\angle CAB$, then $m\angle CAD + m\angle DAB = m\angle CAB$. called **angle addition**. Solve the following problem and explain how it is related to angle addition.

You have a slice of pizza with a central angle that measures 140° that you want to share with your friend. She cuts it through the vertex into two slices. You choose one slice that measures 60° . How many degrees are in the other slice?

For Exercises 23–26, draw each kind of triangle or write “not possible” and explain why. Use your geometry tools to make your drawings as accurate as possible.

23. Isosceles right triangle
24. Scalene isosceles triangle
25. Scalene obtuse triangle
26. Isosceles obtuse triangle
27. Earth takes 365.25 days to travel one full revolution around the Sun. By approximately how many degrees does the Earth travel each day in its orbit around the Sun?
28. Earth completes one full rotation each day, making the Sun appear to rise and set. If the Sun passes directly overhead, by how many degrees does its position in the sky change every hour?

For Exercises 29–37, sketch, label, and mark the figure or write “not possible” and explain why.

29. Obtuse scalene triangle FAT with $m\angle FAT = 100^\circ$
30. Trapezoid $TRAP$ with $\overline{TR} \parallel \overline{AP}$ and $\angle TRA$ a right angle
31. Two different (noncongruent) quadrilaterals with angles of $60^\circ, 60^\circ, 120^\circ,$ and 120°
32. Equilateral right triangle
33. Right isosceles triangle RGT with $RT = GT$ and $m\angle RTG = 90^\circ$
34. An equilateral triangle with perimeter $12a + 6b$
35. Two triangles that are not congruent, each with angles measuring 50° and 70°
36. Rhombus $EQUI$ with perimeter $8p$ and $m\angle IEQ = 55^\circ$
37. Kite $KITE$ with $TE = 2EK$ and $m\angle TEK = 120^\circ$

IMPROVING YOUR REASONING SKILLS



Checkerboard Puzzle

1. Four checkers—three red and one black—are arranged on the corner of a checkerboard, as shown at right. Any checker can jump any other checker. The checker that was jumped over is then removed. With exactly three horizontal or vertical jumps, remove all three red checkers, leaving the single black checker. Record your solution.
2. Now, with exactly seven horizontal or vertical jumps, remove all seven red checkers, leaving the single black checker. Record your solution.

