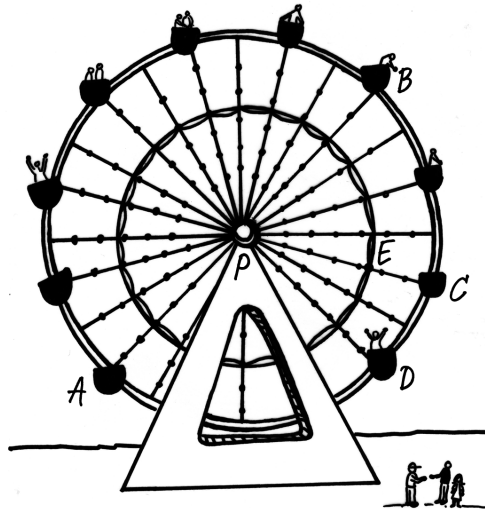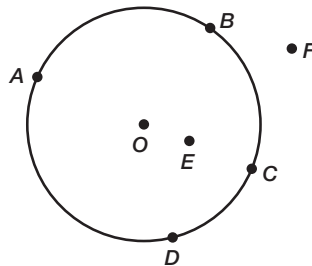A Ferris wheel is in the shape of a circle.

9

Recall that a circle is the set of all points in a plane that are equidistant from a given point, which is called the **center of the circle**. The distance from a point on the circle to the center is the **radius** of the circle. A circle is named by its center. For example, the circle seen in the Ferris wheel is circle *P*.

1. Use the circle to answer each question.

    a. Name the circle.

    b. Use a straightedge to draw $\overline{OB}$, a radius of circle *O*. Where are the endpoints located with respect to the circle?

c. How many radii does a circle have? Explain your reasoning.

d. Use a straightedge to draw $\overline{AC}$. Then, use a straightedge to draw $\overline{BD}$. How are the line segments different? How are they the same?

Both line segments *AC* and *BD* are *chords* of the circle. A **chord** is a line segment with each endpoint on the circle. Line segment *AC* is called a *diameter* of the circle. A **diameter** is a chord that passes through the center of the circle.
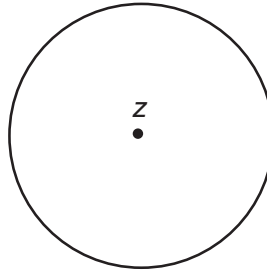
e. Why is $\overline{BD}$ not considered a diameter?

f. How does the length of the diameter of a circle relate to the length of the radius?

g. Are all radii of the same circle, or of congruent circles, always, sometimes, or never congruent? Explain your reasoning.

A **secant of a circle** is a line that intersects a circle at exactly two points.
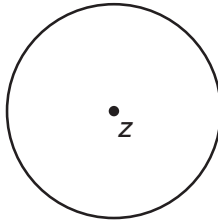
2. Draw a secant using the circle shown.

3. Maribel says that a chord is part of a secant. David says that a chord is different from a secant. Explain why Maribel and David are both correct.

4. What is the longest chord in a circle?

A **tangent of a circle** is a line that intersects a circle at exactly one point. The point of intersection is called the **point of tangency**.

5. Draw a tangent using circle Z shown.

Try to draw different tangent lines through the point you chose.

6. Choose another point on the circle. How many tangent lines can you draw through this point?

7. Explain the difference between a secant and a tangent.

8. Check the appropriate term(s) associated with each characteristic in the table shown.

Characteristic	Chord	Secant	Diameter	Radius	Tangent
A line					
A line segment					
A line segment having both endpoints on the circle					
A line segment having one endpoint on the circle					
A line segment passing through the center of the circle					
A line intersecting a circle at exactly two points					
A line intersecting a circle at exactly one point					