Parts of Circles

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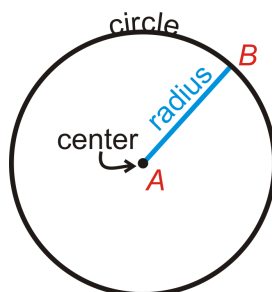*f*lexboo*K*
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CHAPTER **1**

Parts of Circles

Here you'll learn all the vocabulary associated with the parts of a circle.

Circles

A **circle** is the set of all points in the plane that are the same distance away from a specific point, called the **center**. The center of the circle below is point *A*. We call this circle "circle *A*," and it is labeled $\odot A$.

Important Circle Parts

**Radius:** The distance from the center of the circle to its outer rim.

Chord: A line segment whose endpoints are on a circle.

Diameter: A chord that passes through the center of the circle. The length of a diameter is two times the length of a radius.

Secant: A line that intersects a circle in two points.

Tangent: A line that intersects a circle in exactly one point.

**Point of Tangency:** The point where a tangent line touches the circle.
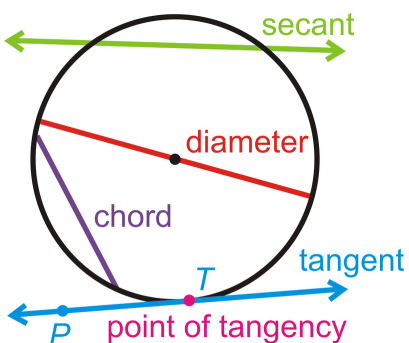
The tangent ray $\overrightarrow{TP}$ and tangent segment $\overline{TP}$ are also called tangents.

Tangent Circles: Two or more circles that intersect at one point.

Concentric Circles: Two or more circles that have the same center, but different radii.

Congruent Circles: Two or more circles with the same radius, but different centers.

tangent circles   concentric circles   congruent circles
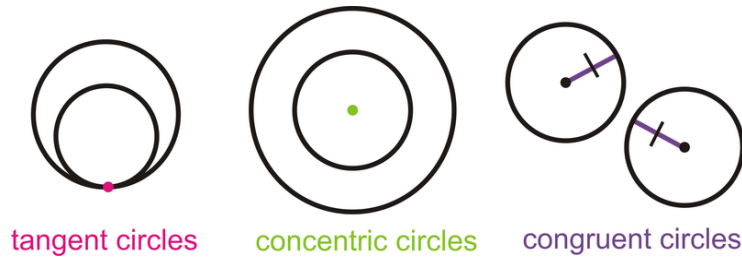
What if you drew a line through a circle from one side to the other that does not pass through the center? What if you drew a line outside a circle that touched the circle at one point? What would you call these lines you drew?
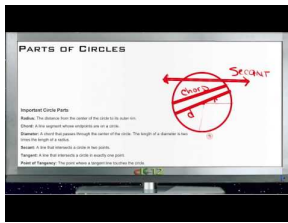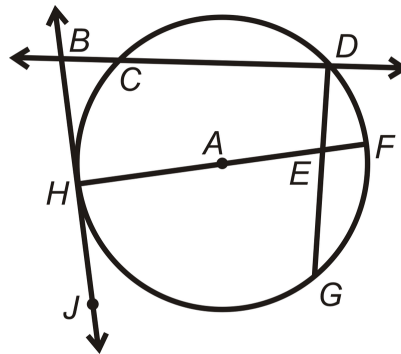

MEDIA
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Examples

Example 1

Find the parts of $\odot A$ that best fit each description.

    a. A radius

$\overline{HA}$ or $\overline{AF}$

    b. A chord

$\overline{CD}$, $\overline{HF}$, or $\overline{DG}$

    c. A tangent line

$\overleftrightarrow{BJ}$

   d. A point of tangency
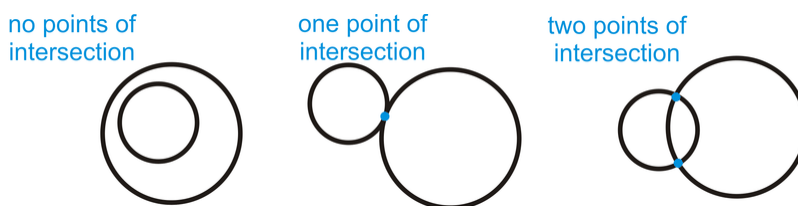
Point H

   e. A diameter

$\overline{HF}$

   f. A secant
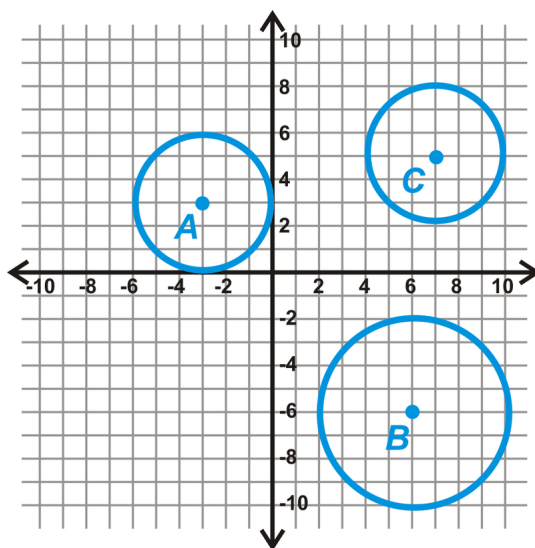
$\overleftrightarrow{BD}$

Example 2

Draw an example of how two circles can intersect with no, one and two points of intersection. You will make three separate drawings.

Example 3

Determine if any of the following circles are congruent.

From each center, count the units to the outer rim of the circle. It is easiest to count vertically or horizontally. Doing this, we have:

$$\text{Radius of } \odot A = 3 \; units$$
$$\text{Radius of } \odot B = 4 \; units$$
$$\text{Radius of } \odot C = 3 \; units$$

From these measurements, we see that $\odot A \cong \odot C$.

Notice the circles are congruent. The lengths of the radii are equal.

Example 4

Is it possible to have a line that intersects a circle three times? If so, draw one. If not, explain.

It is not possible. By definition, all lines are *straight*. The maximum number of times a line can intersect a circle is twice.
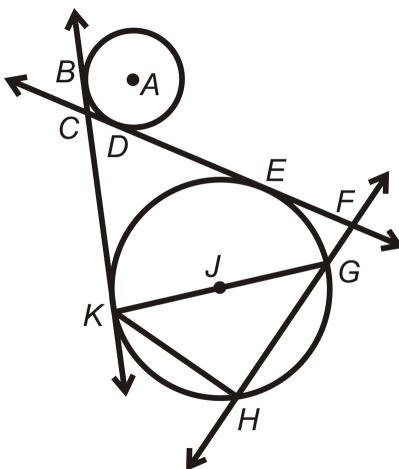
Example 5

Are all circles similar?

Yes. All circles are the same shape, but not necessarily the same size, so they are similar.

Review

Determine which term best describes each of the following parts of $\odot P$.

1. $\overline{KG}$
2. $\overleftrightarrow{FH}$
3. $\overline{KH}$
4. E
5. $\overleftrightarrow{BK}$
6. $\overleftrightarrow{CF}$
7. A
8. $\overline{JG}$
9. What is the longest chord in any circle?

Use the graph below to answer the following questions.

10. Find the radius of each circle.
11. Are any circles congruent? How do you know?
12. Find all the common tangents for $\odot B$ and $\odot C$.
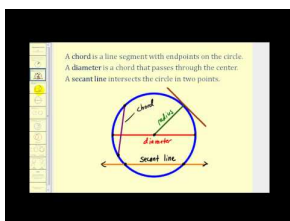13. $\odot C$ and $\odot E$ are externally tangent. What is CE?

14. Find the equation of $\overline{CE}$.
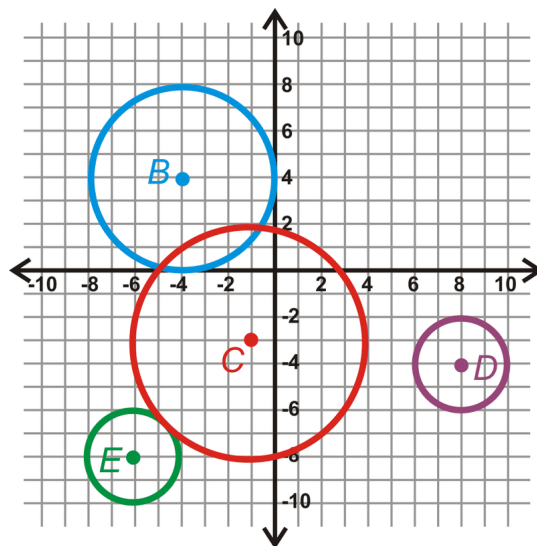
Review (Answers)

To see the Review answers, open this PDF file and look for section 9.1.

Resources