

Lesson 1.07 Circles & Arcs

Students will be able to:

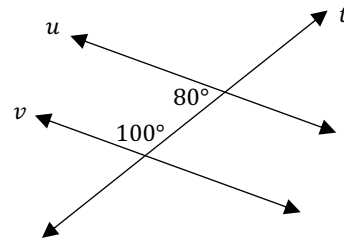
- Content Objective: Define a usable definition for a circle.
- Language Objective: Explain how two circles can intersect to form an equilateral triangle.



Warm Up

Given lines u and v cut by transversal t , answer the following questions. The diagram below is not drawn to scale.

- Are lines u and v parallel? Explain.
- Are there any other angles equivalent to 80° ? Label them on the diagram.
- Is line t perpendicular to lines u and v ? Explain.



Vocabulary Review

Match each of the following terms to the correct definition.

- | | |
|---------------------------|---|
| 1. _____ Theorem | a. A mathematical statement that can be assumed without proof. |
| 2. _____ Postulate | b. A statement in which the hypothesis and conclusion is switched. |
| 3. _____ Converse | c. Lines that never intersect. |
| 4. _____ Perpendicular | d. Lines that intersect to form right angles. |
| 5. _____ Playfair's axiom | e. Through any point not on a given line, there exists exactly one parallel line to the given line. |
| 6. _____ Parallel | f. A mathematical statement that is proved to be true. |



Graphic Organizer

Circles & Arcs

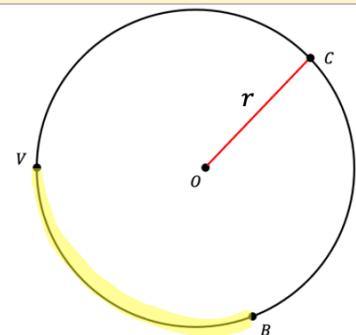
Circle:

The collection of all points that are a fixed distance away from the center (also a fixed point).

Arc:

A subset of the collection of points that lie on a circle.

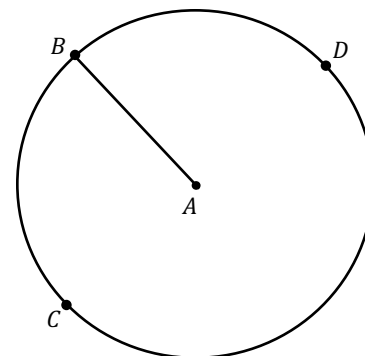
Shown is circle _____ with radius _____, and highlighted is arc _____.




Skill 1: Center and Radius

Given the circle shown below, complete the following.

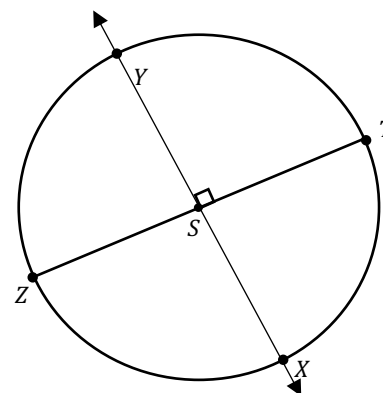
- Identify the center and find the measure of the radius.
- Construct \overline{CA} and \overline{DA} and measure their lengths. What do you notice?
- What does \overline{CD} represent? What can we say about C , A , and D ?
- Identify all arcs shown.


Exercise 1: Center and Radius

Given the circle with center S shown below, complete the following.

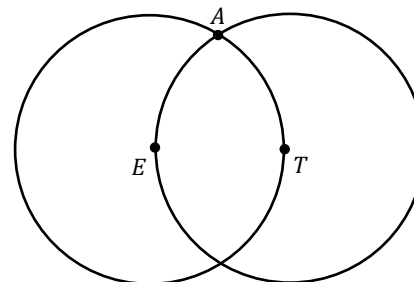
- What is true about \overline{YS} , \overline{ZS} , \overline{XS} , and \overline{TS} ?
- Fill in the blank below to make a correct mathematical equation.

$$2 \cdot ZS = \underline{\hspace{2cm}}$$
- Is \overline{YX} the perpendicular bisector of \overline{ZT} ? Explain.


Talk it Out

Use the diagram to complete the following.

- Name all circles shown.
- Construct \overline{EA} , \overline{ET} , and \overline{AT} . What is true about these line segments?
- What type of triangle is $\triangle EAT$?


Check Point

Multiple Choice. Which of the following statements is *not* true?

- | | |
|---|---|
| (1) Two circles that intersect must have two intersection points. | (2) All points on a circle are equidistant from the center point. |
| (3) A circle is named by its center point. | (4) The diameter of a circle is twice the radius. |

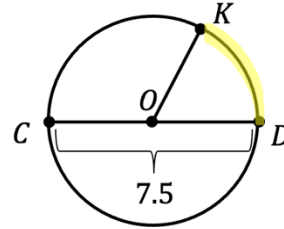


Problem Set

Name: _____

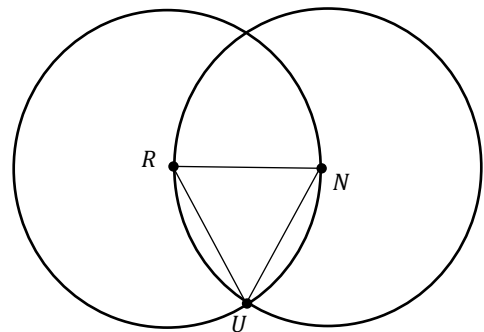
1. Given the circle below, complete the following.

- Find the length of \overline{OK} .
- Express the highlighted arc in symbolic notation.



2. In the diagram below, $RN = 5x + 2$, and $RU = 9x - 6$.

- Label the diagram with the given information.
- What is true about \overline{RN} and \overline{RU} ? Explain your reasoning.



c. Set up an equation and solve for x .

d. What type of triangle is $\triangle RNU$?

e. Find the length of \overline{NU} .

3. Circles are used every day in real life. For example, on the compass shown, the red needle is pointing 45° NE.

- Write a line segment that represents the diameter of circle O .
- How many degrees is a full rotation around a point?
- What is the measure of $\angle DOB$? How do you know?

