7

Mathematics

Quarter 3: Week 6 - Module 6
CIRCLE

AIRs - LM

Mathematics Grade 7

Quarter 3: Week 6 - Module 6: **Circle**

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Target

In this topic, you will learn how to illustrate a circle and the terms related to it.

After going through this module, you are expected to:

Learning Competency:

illustrates a circle and the terms related to it: radius, diameter, chord, center, arc, central angle and inscribe angle **(M7GE-IIIg-1)**

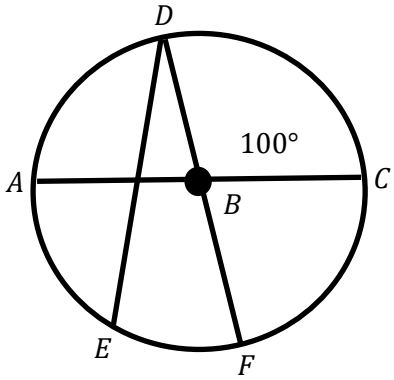
Before going on, check how much you know about this topic. Answer the pre-test in a separate sheet of paper.

Pre – Assessment

***Directions*:** Select the letter of the correct answer. Write your answer on a separate sheet of paper.

1. What is the figure/shape formed if the set of all points are the same distance from a fixed point?
   A. circle B. parallelogram C. rectangle D. triangle
2. What do you call the fixed point of the circle?
   A. center B. chord C. diameter D. radius
3. What segment connects any two points of a circle?
   A. arc B. chord C. diameter D. radius
4. What do you call a chord that passess through the center of a circle?
   A. arc B. chord C. diameter D. radius
5. Which portion of a circle determined by a central angle?
   A. arc B. chord C. diameter D. radius
6. Which of the following is NOT true?
   A. All diameters are chords.
   B. All diameters intersect at a point.
   C. Two radii always have the same length.
   D. Two chords always have the same length.
7. Which angle whose vertex is on the circle's center and whose sides intersect the circle at two points?
   A. acute B. central C. inscribed D. right
8. Which angle whose vertex is a point on the circle and whose sides intersect the circle at two points?
   A. acute B. central C. inscribed D. right
9. Which of the following statement is true?
   A. A radius is not a chord.
   B. All chords are diameters.
   C. All chords intersect at one point.
   D. Two chords always have the same length

For items 10 – 15, refer from the figure below.

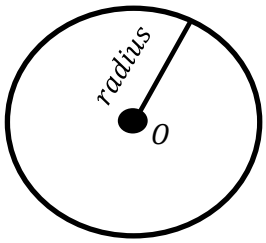


10. Which of the following is the correct name the circle?
    A. circle A B. circle B C. circle C D. circle D
11. Which is the diameter?
    A. $\overline{AB}$ B. $\overline{BC}$ C. $\overline{BF}$ D. $\overline{DF}$
12. Which is the radius?
    A. $\overline{AC}$ B. $\overline{BA}$ C. $\overline{DF}$ D. $\overline{DE}$
13. Which is the chord?
    A. $\overline{AB}$ B. $\overline{BC}$ C. $\overline{DB}$ D. $\overline{DE}$
14. Which of the following is a semicircle?
    A. $\overset{\frown}{AEF}$ B. $\overset{\frown}{DAE}$ C. $\overset{\frown}{DCF}$ D. $\overset{\frown}{EFC}$
15. What is the measure of $\overset{\frown}{\text{CF}}$?
    A. 80° B. 90° C. 100° D. 120°

Jumpstart

Study the figures below:

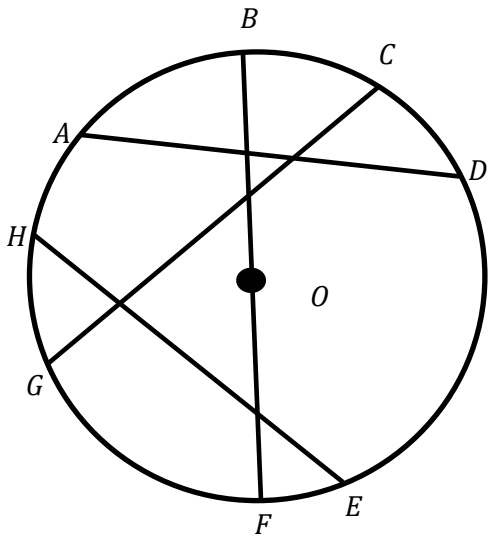
A.



A **circle** is the set of all fixed points tat are the same distance from a fixed point. This fixed point is called the **center** of the circle. A segment drawn from any point on the circle to the center is called a **radius**.

Note: A circle is named by its center. The cirle above is called circle O.

B.

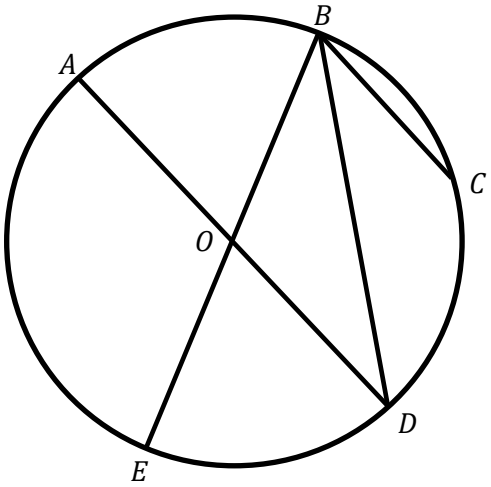


On circle O, segments $\overline{AD}$, $\overline{BF}$, $\overline{CG}$, and $\overline{HE}$ were constructed so that their endpoints are points on the circle. Measure each segment and determine which of these segments is the longest. The activity introduced you to other points of a circle.

A **chord** is a segment that connects any two points of a circle. $\overline{AD}$, $\overline{BF}$, $\overline{CG}$, and $\overline{HE}$ are the chords of circle O.

A **diameter** is a chord that passes through the center of a circle. $\overline{BF}$ is a diameter of circle O. It is the longest chord of a circle and it is twice the length of a circle's radius.

C.



On circle O, segment $\overline{AD}$, $\overline{BD}$, $\overline{BC}$, and $\overline{BE}$ were constructed so that their endpoints are points on the circle.

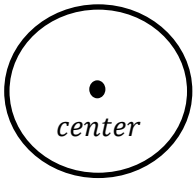
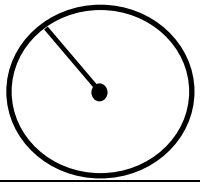
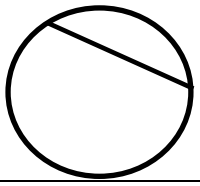
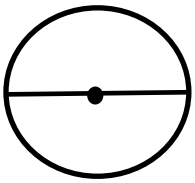
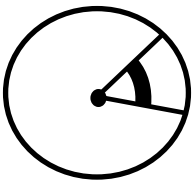
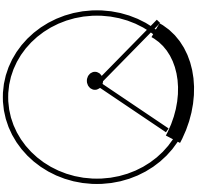
A **central angle** is an angle whose vertex is on the circle's center, and whose sides intersect the circle at two points. $\angle AOB$, $\angle BOD$, $\angle DOE$, and $\angle EOA$ are central angels of circle O. If $\angle AOB = 60°$, then arc $\overset{\frown}{AB}(AB) = 60°$ and if $\angle AOE = 120°$, then arc $\overset{\frown}{AE}(AE) = 120°$

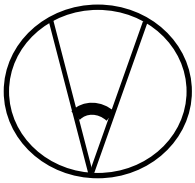
An **arc** is a portion of a circle by a central angle or an inscribed angle. $\overset{\frown}{AB}$, $\overset{\frown}{BC}$, $\overset{\frown}{CD}$, $\overset{\frown}{EA}$ and $\overset{\frown}{DE}$ are arcs of circle O.

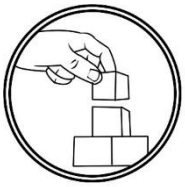
An **inscribed angle** is an angle whose vertex is a point on the circle whose sides intersect the circle at two points. $\angle ADB$, $\angle EBD$, $\angle DBC$ and $\angle EBC$ are inscribed angles of circle O. If $\angle ADB = 30°$, then $\overset{\frown}{AB} = 60°$, if $\angle EBD = 40°$, then $\overset{\frown}{ED} = 80°$, if $\angle DBC = 45°$, then $\overset{\frown}{DC} = 90°$, $\angle EBC = 60°$, then $\overset{\frown}{EC} = 120°$.

Discover

To generalize circle and the terms related to it, below is the list of terms with its definitions and illustrations.

TERM	DEFINITION	ILLUSTRATION
Circle	The set of all points that are the same distance from a fixed point. This fixed point is called the center of the circle.	
Radius	A segment drawn from any point on the circle to the center.	
Chord	A segment that connects any two points of a circle.	
Diameter	A chord that passess through the center of a circle. It is the longest chord of a circle and it is twice the length of a circle's radius.	
Central Angle	An angle whose vertex is on the circle's center and whose sides intersect the circle at two points. The measure of the central angle is equal to its intercepted arc.	
Arc	A portion of a circle determined by a central angle or an inscribed angle.	

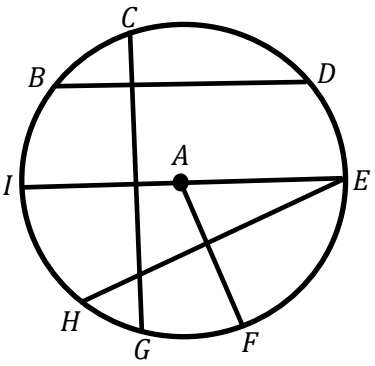
Inscribed Angle	An angle whose vertex is a point on the circle and whose sides intersect the circle at two points. The measure of the inscribed angle is equal to one-half the measure of its intercepted arc.	



Explore

Here are some activities for you to work on to master and strengthen the basic concepts you have learned from this lesson.

Activity 1: Use the figure (circle A) to answer the activity.

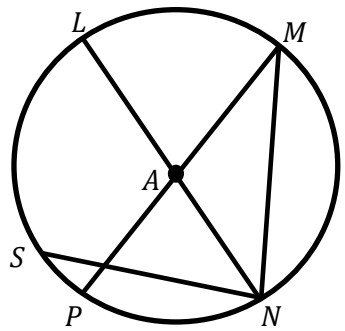


Identify the following parts of the circle.

1. $\overline{BD}$ = _____
2. $\overline{AF}$ = _____
3. A = _____
4. $\widehat{EF}$ = _____
5. $\overline{IE}$ = _____
6. $\angle IAF$ = _____
7. $\angle IEH$ = _____
8. $\widehat{IH}$ = _____
9. $\overline{CG}$ = _____
10. $\overline{AE}$ = _____

Deepen

Activity 2: From the figure below, list the following parts of the circle.



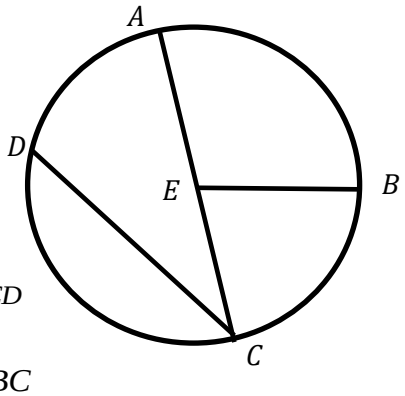
1. 4 radii
2. 4 chords
3. 2 diameter
4. 4 central angles
5. 4 inscribed angles

Gauge

Directions: Write the letter of the correct answer on your answer sheet.

1. Which of the following is a closed figure whose all points are epidistant to a fixed point called center?
   A. angle B. circle C. point D. polygon
2. Which part of a circle is a line segment that connects the center and any point on the circle?
   A. chord B. diameter C. inscribed angle D. radius
3. How is diameter called a special chord? The only chord that has _____.
   A. three endpoints. B. smallest length.
   C. pass through the center. D. three non-collinear points
4. What do you call the fixed point of the circle?
   A. center B. chord C. diameter D. radius
5. What portion of a circle is determined by a central angle or inscribed angle?
   A. arc B. chord C. diameter D. radius
6. Which of the following statement is true?
   A. A radius is not a chord.
   B. All chords are diameters.
   C. All chords intersect at one point.
   D.Two chords always have the same length.
7. Which of the following statement is NOT true?
   A. All diameters are chords.
   B. All diameters intersect at one point.
   C. Two radii always have the same length.
   D. Two chords always have the same length.

For item 8-15, refer to the figure at the right.



8. What is the name the circle?
   A. circle B B. circle C C. circle D D. circle E
9. Which is the radius?
   A. $\overline{AC}$ B. $\overline{CD}$ C. $\overline{AD}$ D. $\overline{AE}$
10. Which is the diameter?
    A. $\overline{AC}$ B. $\overline{AE}$ C. $\overline{CE}$ D. $\overline{BE}$
11. Which is the chord?
    A. $\overline{AE}$ B. $\overline{EB}$ C. $\overline{CD}$ D. $\overline{EC}$
12. Which is the central angle?
    A. $\angle ACD$ B. $\angle AEB$ C. $\angle DCA$ D. $\angle BCD$
13. Which is the inscribed angle?
    A. $\angle AEB$ B. $\angle BEC$ C. $\angle ACD$ D. $\angle ABC$
14. If $\angle ACD = 40°$, what is the measure of $\overset{\frown}{AD}$?
    A. 20° B. 30° C. 40° D. 50°
15. If $\angle AEB = 105°$, what is the measure of $\overset{\frown}{AB}$?
    A. 100° B. 105° C. 110° D. 115°