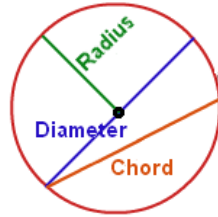


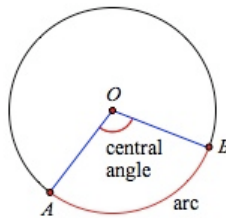
9B – Features of a Circle

❖ Vocabulary, Formulas, Theories:

- **Chord:** a segment from one part of a circle to another. See how it comes to a radius and diameter of a circle in the following diagram.

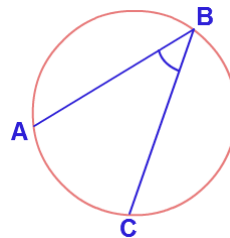


- **Central Angle:** an angle in a circle where the vertex is the center of the circle and the rays that create the angle are the radii.



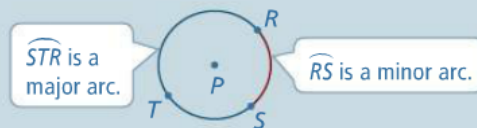
- **Inscribed Angle:** an angle in a circle where the vertex is located on the perimeter of the circle and the rays that create the angle are chords. The measure of the angle is one half the intercepted arc and is calculated using the following formula:

$$m\angle ABC = \frac{1}{2} \cdot mAC$$



- **Arcs:** parts of a circle. Click [here](#) for an animation that helps to show the difference.
 - minor arc: an arc that has a measure under 180 degree
 - major arc: an arc that has a measure over 180 degrees.

An arc is a part of a circle. One type of arc, a **semicircle**, is half of a circle. A **minor arc** is smaller than a semicircle. A **major arc** is larger than a semicircle. You name a minor arc by its endpoints and a major arc or a semicircle by its endpoints and another point on the arc.



- **Measure of an Arc:** the measure of an arc on a circle. It's associated with but different than a length of an arc.

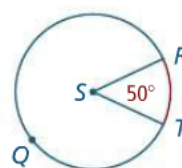
Arc Measure

The measure of a minor arc is equal to the measure of its corresponding central angle.

The measure of a major arc is the measure of the related minor arc subtracted from 360.

The measure of a semicircle is 180.

Example



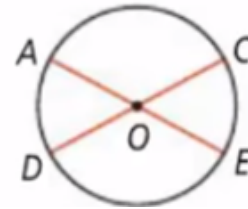
$$\begin{aligned}
 m\widehat{RT} &= m\angle RST = 50 \\
 m\widehat{TQR} &= 360 - m\widehat{RT} \\
 &= 310
 \end{aligned}$$

It's possible that a circle will have multiple points on it. These points create arcs. Some of the arcs are minor arcs (under 180 degrees) and some of the arcs are major arcs (over 180 degrees). If it equals 180 degrees, it's referred to as a semicircle, or half a circle.

Video - ["Circles - Major Arcs, Minor Arcs, Central Angle" - vtmehipa \(12:42\)](#)

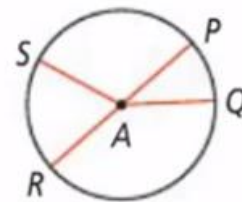
EX1) Answer the following questions:

- What are the minor arcs of Circle O?
- What are the semicircles of Circle O?
- What are the major arcs of Circle A that contain point A?



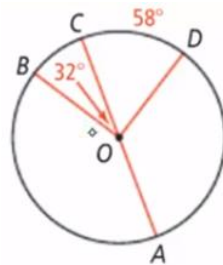
EX2) Answer the following questions:

- What are the minor arcs of Circle A?
- What are the semicircles of Circle A?
- What are the major arcs of Circle A that contain point Q?



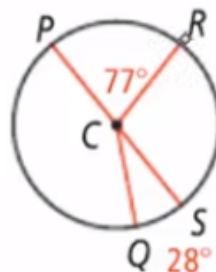
EX3) What are the measures of the arcs:

- mBC
- mBC
- $mABC$
- mAB



EX4) What are the measures of the arcs:

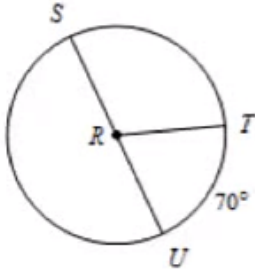
- mPR
- mRS
- $mPRQ$
- $mPQR$



The most common angle involving a circle is called a central angle. This is an angle created inside the circle where the vertex is located on the center and the segments of the angle are radii. The segments extend to the edge of the circle. The part of the circle that is intercepted is called an arc. An arc can be labeled a minor arc or a major arc.

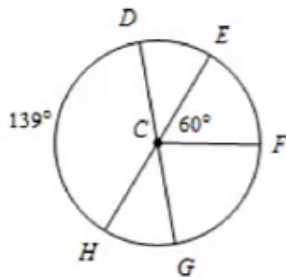
 [Video - "Central Angles Video #1" - Niles North Math \(1:32\)](#)

EX5) Determine the value of $m\angle SRT$.



 [Video - "Central Angles Video #2" - Niles North Math \(5:52\)](#)

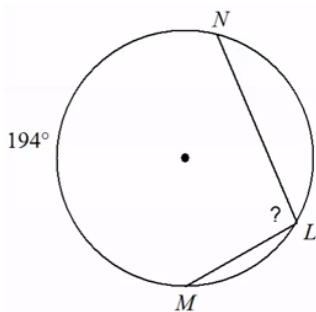
EX6) Determine the value of $m\angle HCG$, $m\widehat{FH}$, $m\widehat{FDG}$, and $m\widehat{HEG}$.



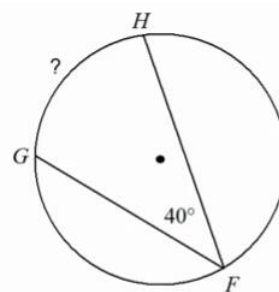
Central angles tend to be the “main” angles of circles. The vertex is on the center. Well if that vertex is “pushed back” onto the edge of a circle, it’s an inscribed angle. The following videos demonstrates this type of angle.

 [Video - "Circles - Inscribed Angles" - MrStanislow \(6:28\)](#)

EX7) Determine the value of the unknown angle.

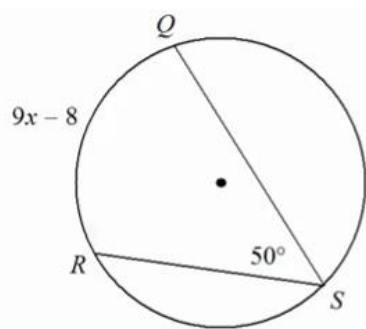


EX8) Determine the value of the unknown arc.



EX9) Determine the value of the unknown variable.

a)



b)

