

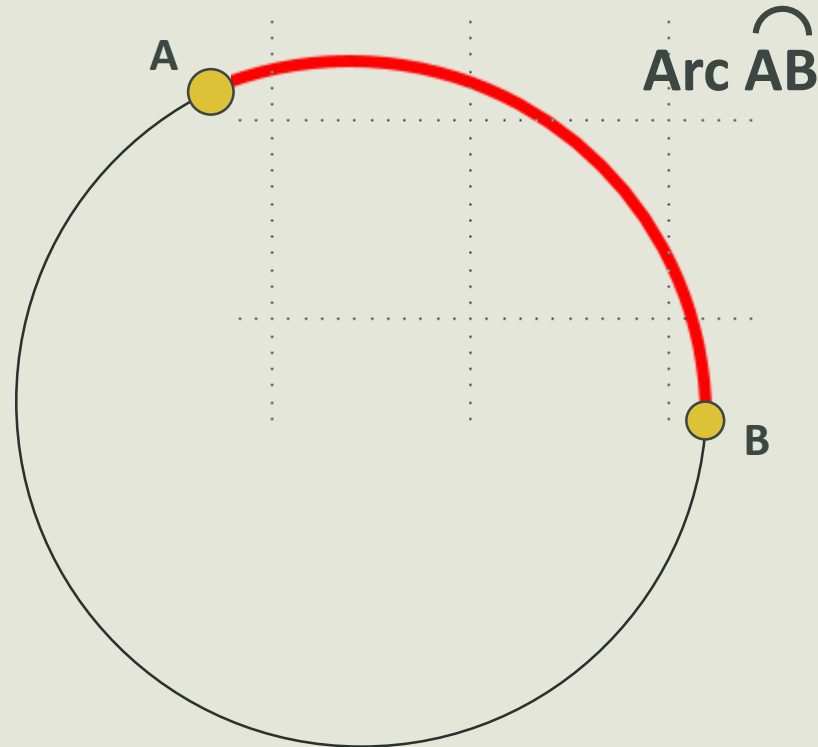
The background is a dark grey surface with various white chalk-like sketches. On the left, there is a detailed drawing of a microscope. Above it, a globe of the Earth is sketched. In the bottom left, there are sketches of a stack of books and a cross-like geometric shape. In the bottom right, there are sketches of a percentage sign, an exclamation mark, and a right-angle symbol. A large white rectangular area is positioned in the upper right, containing the title text. Below this white area is a solid yellow horizontal bar.

Circles – Modules 15

Module 15: Arcs, Angles, and Segments in Circles

Arcs – Notations and Definitions

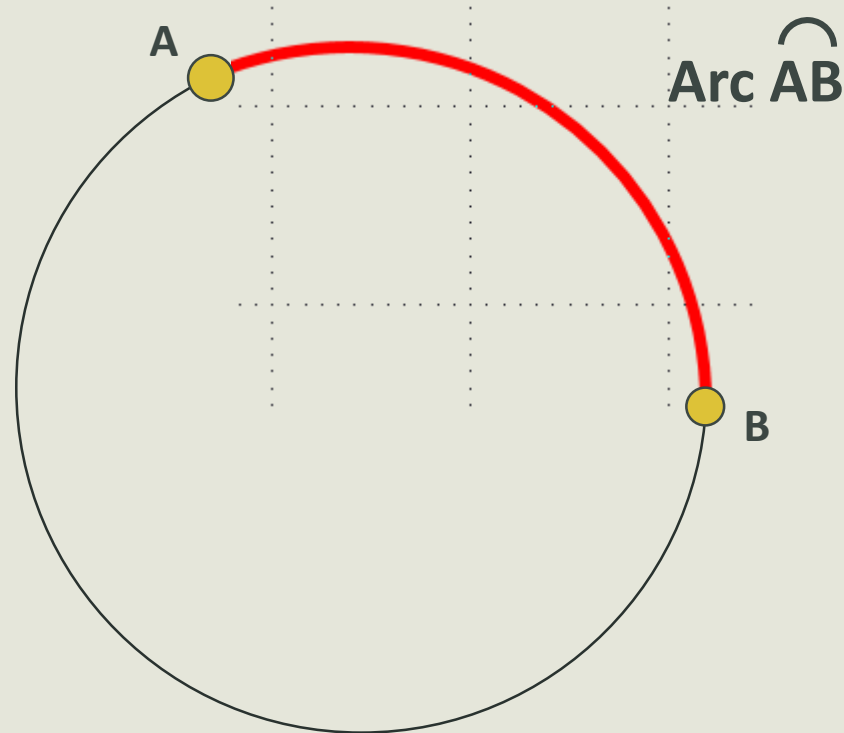
Arc – A portion of the exterior of a circle, bounded by two endpoints.



Module 15: Arcs, Angles, and Segments in Circles

Arcs – Minor Arcs and Major Arcs

Minor Arc – An arc that is less than $\frac{1}{2}$ the circumference of a circle. Defined by 2 endpoints.

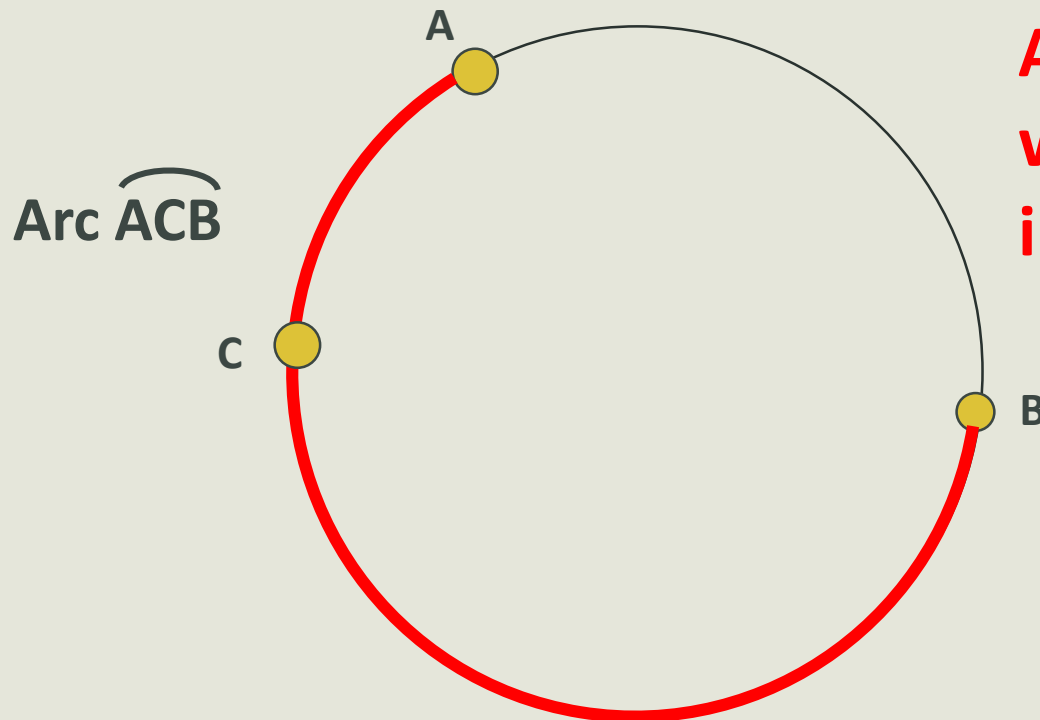


Module 15: Arcs, Angles, and Segments in Circles

Arcs – Minor Arcs and Major Arcs

Major Arc – An arc that is MORE than $\frac{1}{2}$ the circumference of a circle.

Defined by 3 points: 2 endpoints and a point in between.

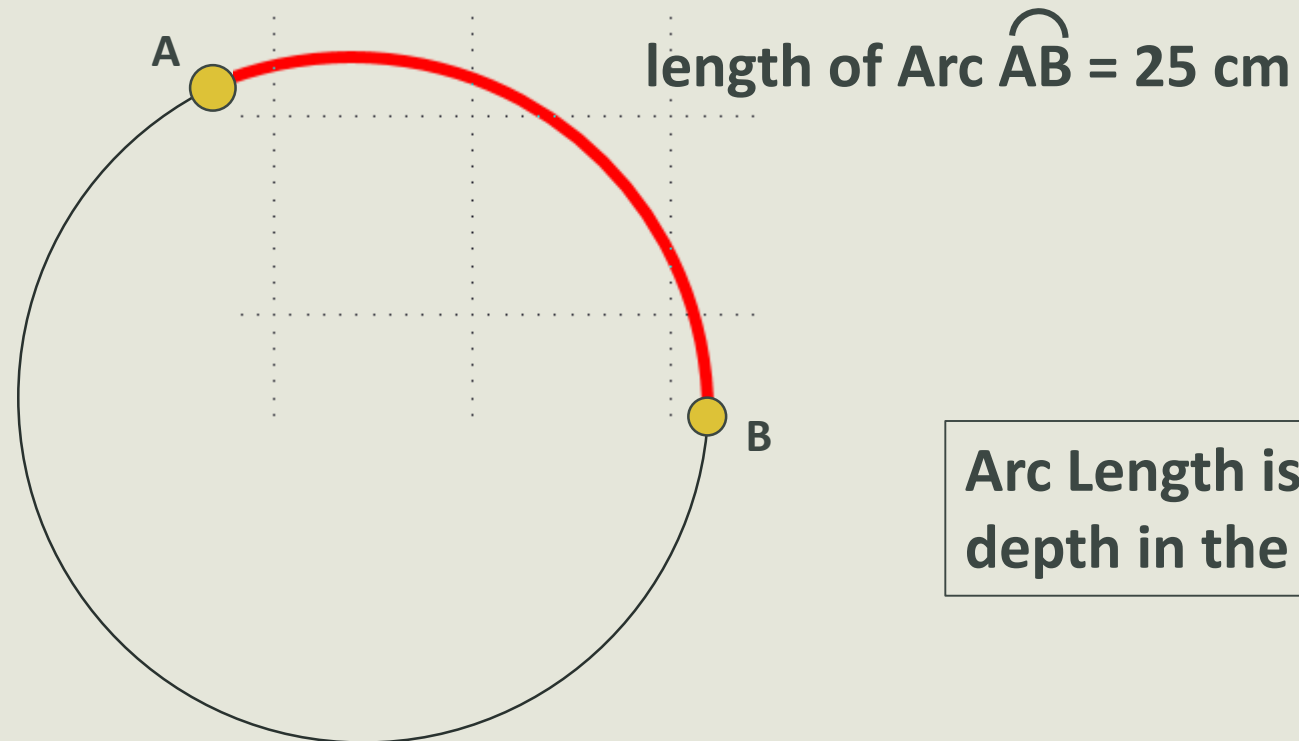


At what point around the circle would a major and a minor arc be indistinguishable?

Module 15: Arcs, Angles, and Segments in Circles

Arcs – Lengths and Measures

Arc Length – How long an arc is in linear units (such as centimeters).
How far a distance would we travel if we walked along the arc.



Arc Length is discussed in depth in the NEXT module.

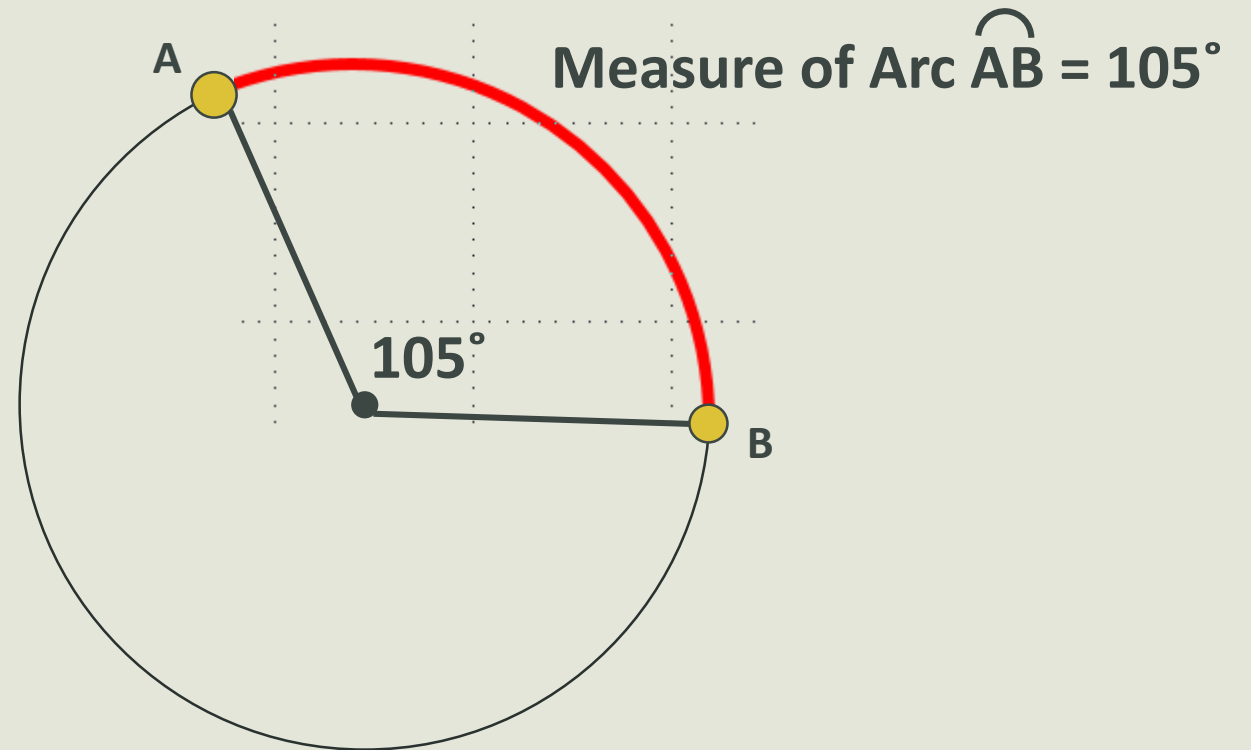
Module 15: Arcs, Angles, and Segments in Circles

Arcs – Lengths and Measures

Arc Measure – What portion of the circumference of the circle is the arc containing.
Measured in degrees out of 360° .

Central Angle – The angle created by two radii of the circle, with the vertex being the center of the circle.

The degree measure of a **CENTRAL ANGLE**
and its **INTERCEPTED ARC** are the same!



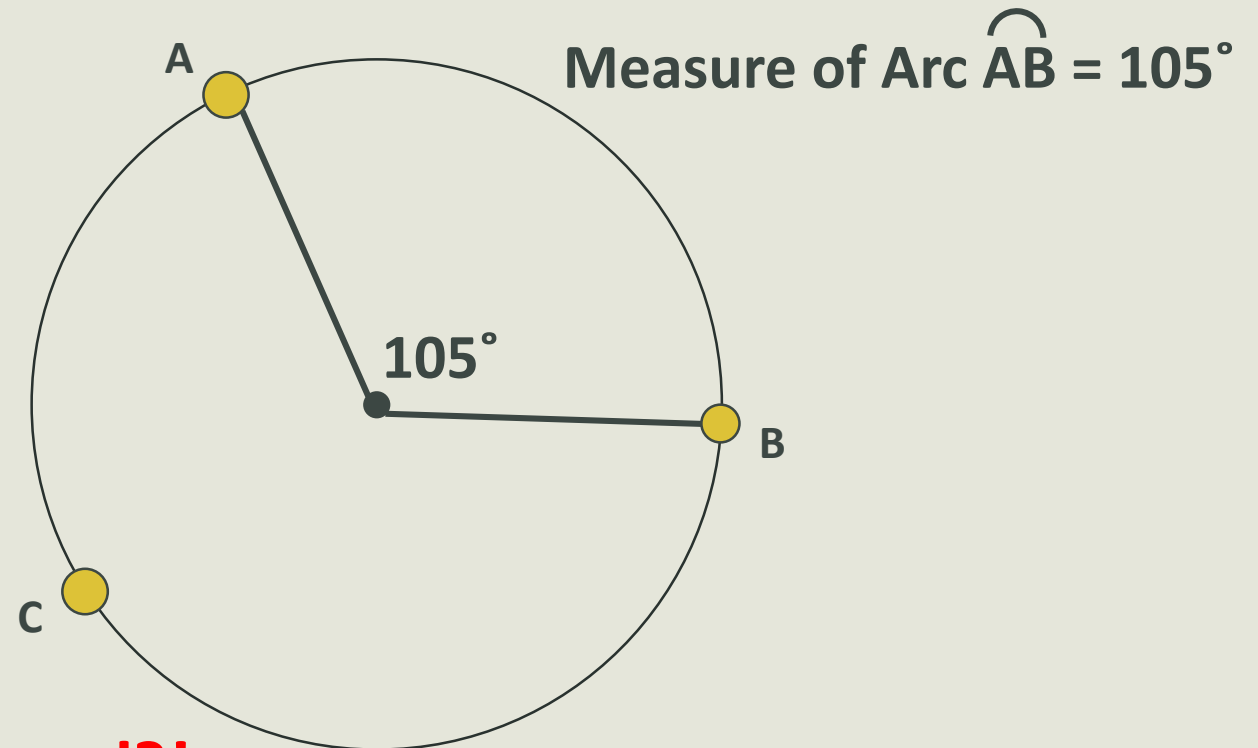
Module 15: Arcs, Angles, and Segments in Circles

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What would the measure of Arc \widehat{ACB} equal?!

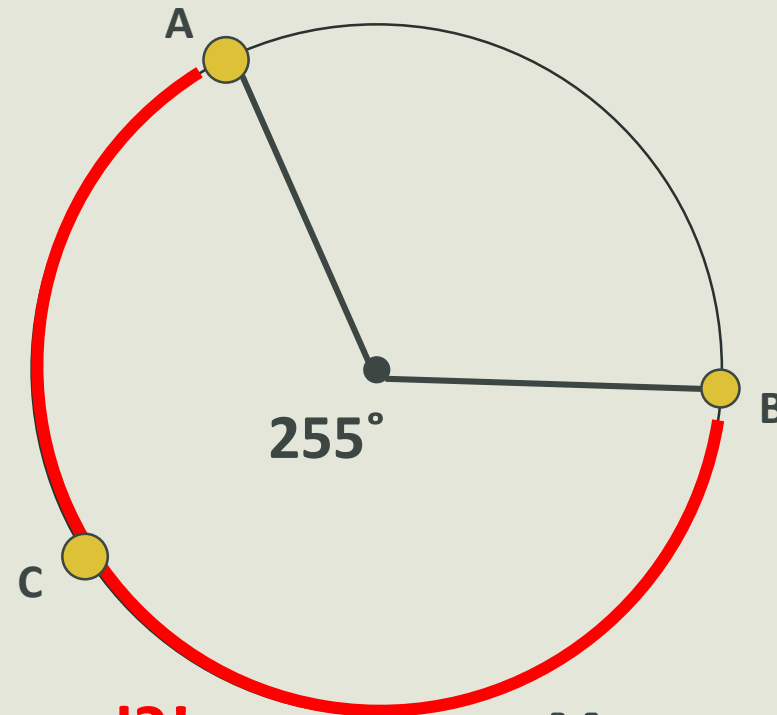
Module 15: Arcs, Angles, and Segments in Circles

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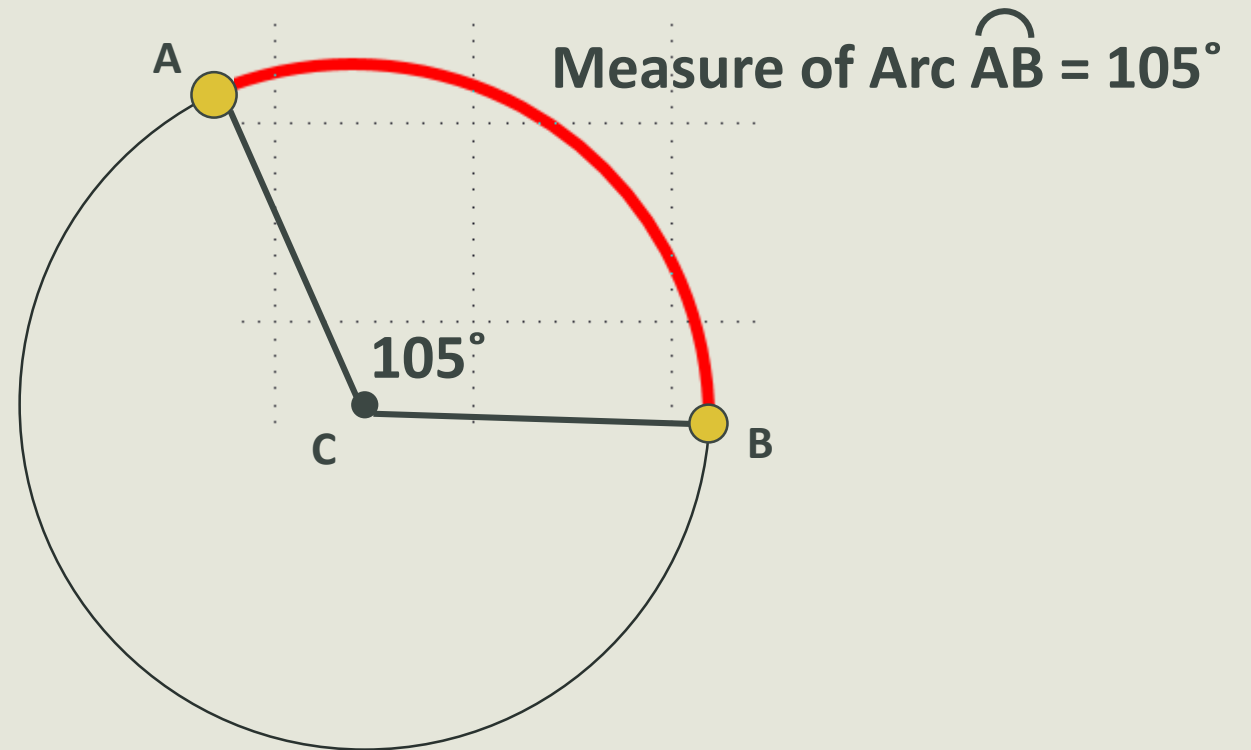
Measure of Arc $\widehat{ACB} = 255^\circ$

Module 15: Arcs, Angles, and Segments in Circles

Intercepted Arc

Intercepted Arc – The arc created by legs on an angle formed within a circle (or without!)

Arc AB is the intercepted arc of angle **ACB**



Module 15: Angles and Segments in Circles

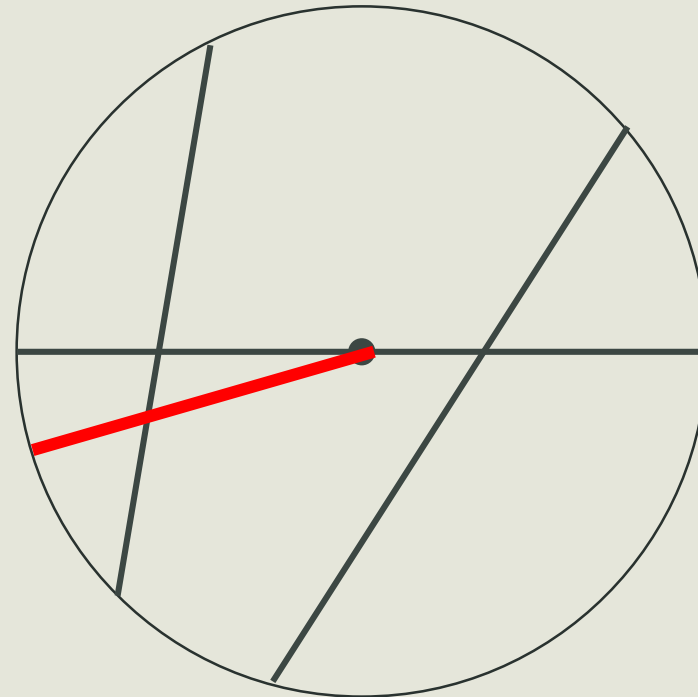
Vocabulary - Chords

Chords – A segment whose endpoints lie on the outside of a circle.

Each of the segments in the diagram are chords.

Notice that even a diameter is a chord!

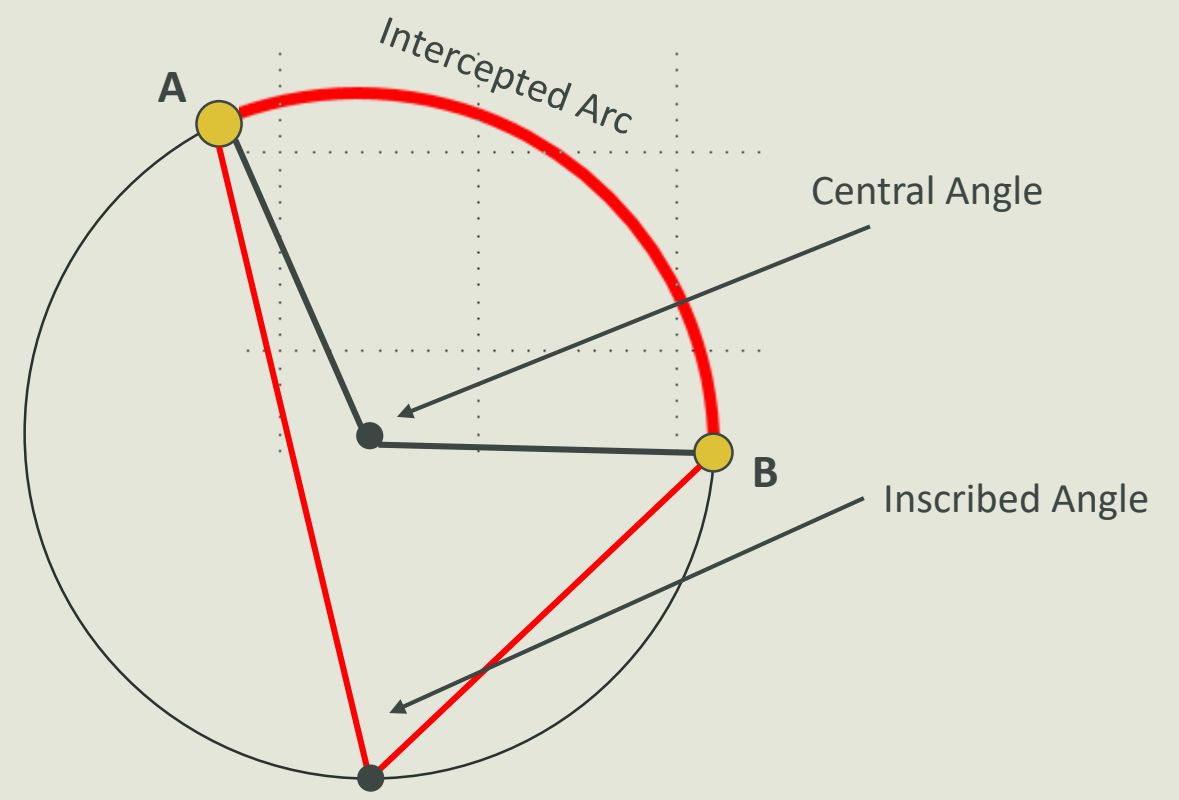
(A radius, however, is not a chord as it only intersects the outside of the circle at one point.)



Module 15: Angles and Segments in Circles

Inscribed Angle

Inscribed Angle – An angle intercepting an arc whose vertex is on the outside of the circle. *(Notice that an inscribed angle is created by 2 chords!)*



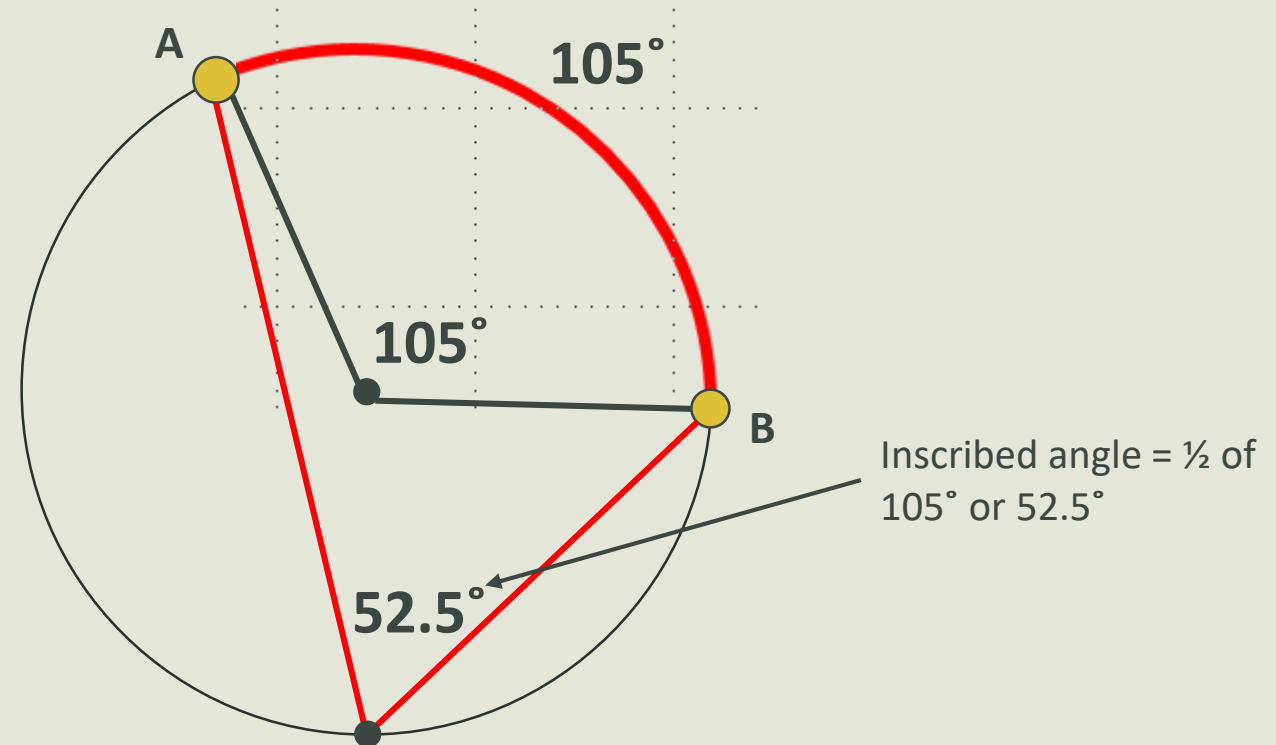
Module 15: Angles and Segments in Circles

Inscribed Angle

Inscribed Angle – An angle intercepting an arc whose vertex is on the outside of the circle. (Notice that an inscribed angle is created by 2 chords!)

IMPORTANT PROPERTY TO MEMORIZE:

The degree measure of an **INSCRIBED ANGLE** is $\frac{1}{2}$ the measure of its intercepted arc. Note that this means an inscribed angle is also $\frac{1}{2}$ the measure of its corresponding central angle!

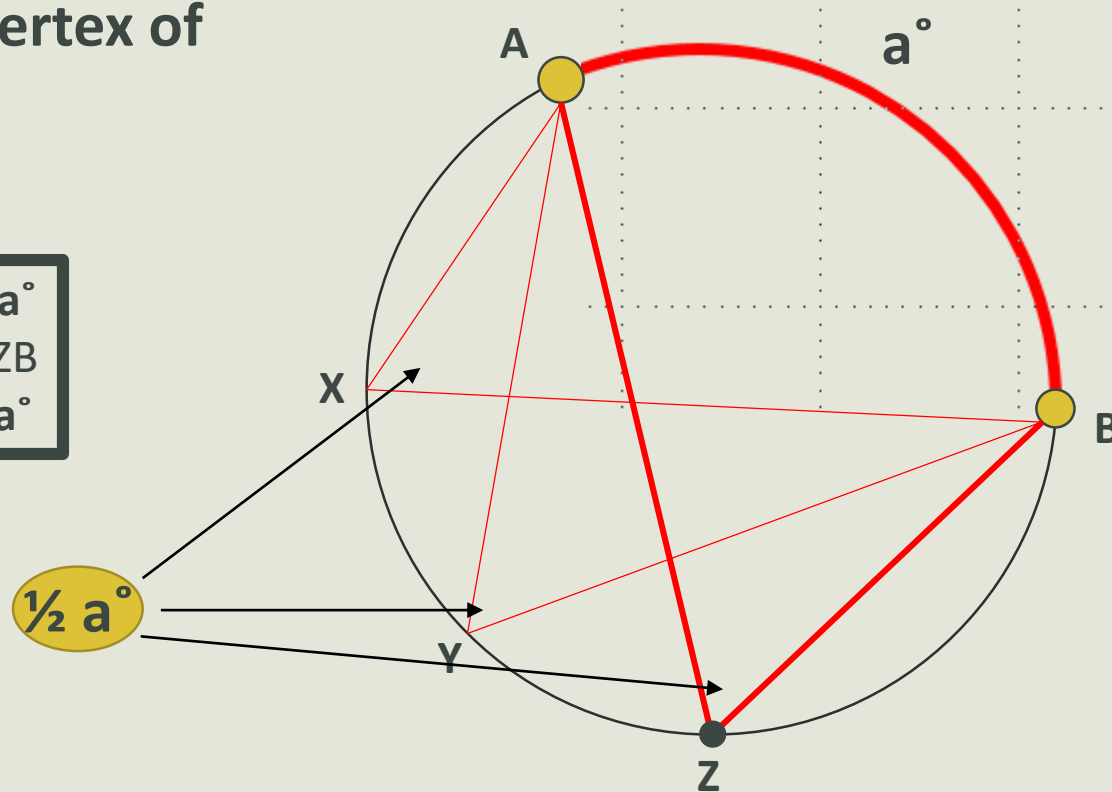


Module 15: Angles and Segments in Circles

Inscribed Angles

Inscribed Angles will always be $\frac{1}{2}$ the measure of their intercepted arc, no matter where on the circle the vertex of the intercepted angle is!

If the measure of arc AB is a°
Then $\angle AXB$, $\angle AYB$, and $\angle AZB$
each have a measure of $\frac{1}{2} a^\circ$

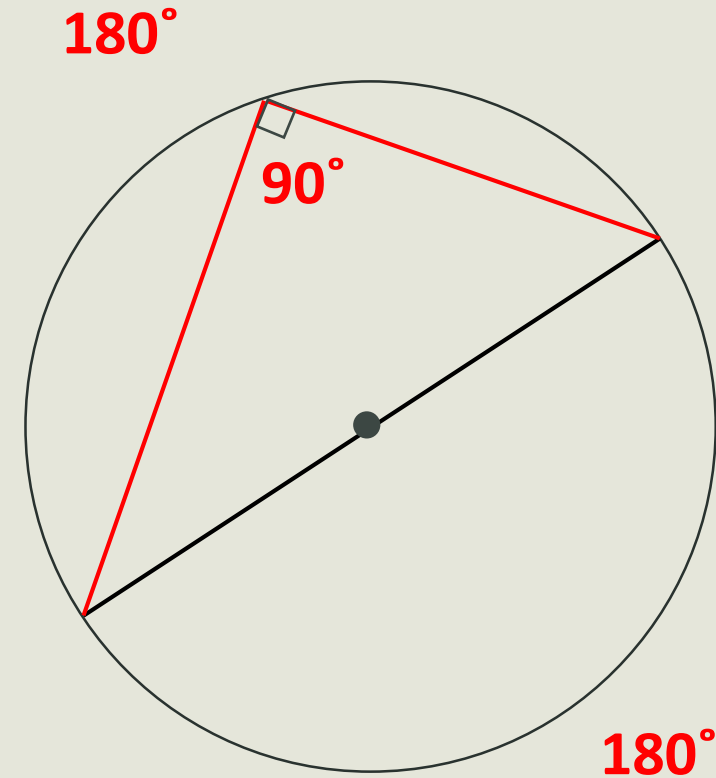


Module 15: Angles and Segments in Circles

A NOTE ABOUT DIAMETERS

Notice that a diameter cuts a circle in half, creating two 180° arcs. There will be times when this fact alone will be needed to solve a problem (you will not have enough angle measure information given without this knowledge.)

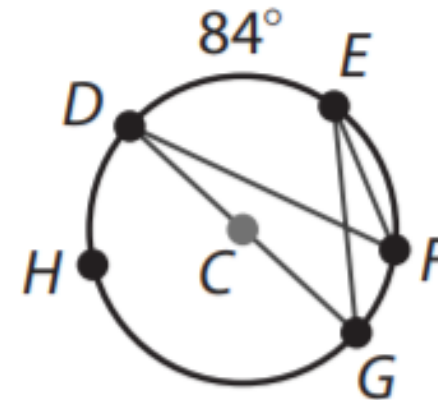
If one were to create an inscribed angle that intersected the circle at both ends of the diameter, the measure of that angle would be equal to what measure?



Module 15: Angles and Segments in Circles

Inscribed Angles

In circle C , $m\widehat{DE} = 84^\circ$. Find each measure.



5. $m\angle DGE$

6. $m\angle EFD$

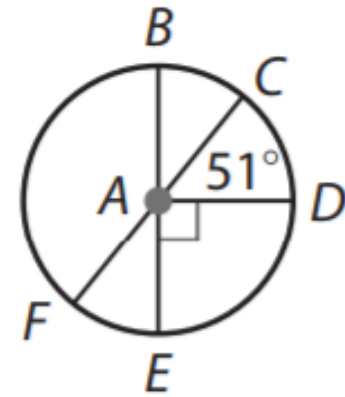
Module 15: Angles and Segments in Circles

The center of the circle is A . Find each measure using the appropriate theorems and postulates.

7. $m\widehat{CE}$

8. $m\widehat{DF}$

9. $m\widehat{BEC}$

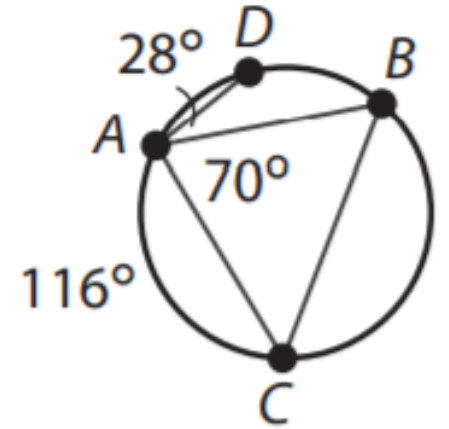


Module 15: Angles and Segments in Circles

Find each measure using the appropriate theorems and postulates. $m\widehat{AC} = 116^\circ$

10. $m\widehat{BC}$

11. $m\widehat{AD}$

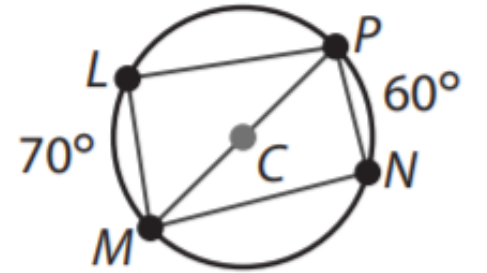


Module 15: Angles and Segments in Circles

The center of the circle is C . Find each measure using the appropriate theorems and postulates. $m\widehat{LM} = 70^\circ$ and $m\widehat{NP} = 60^\circ$.

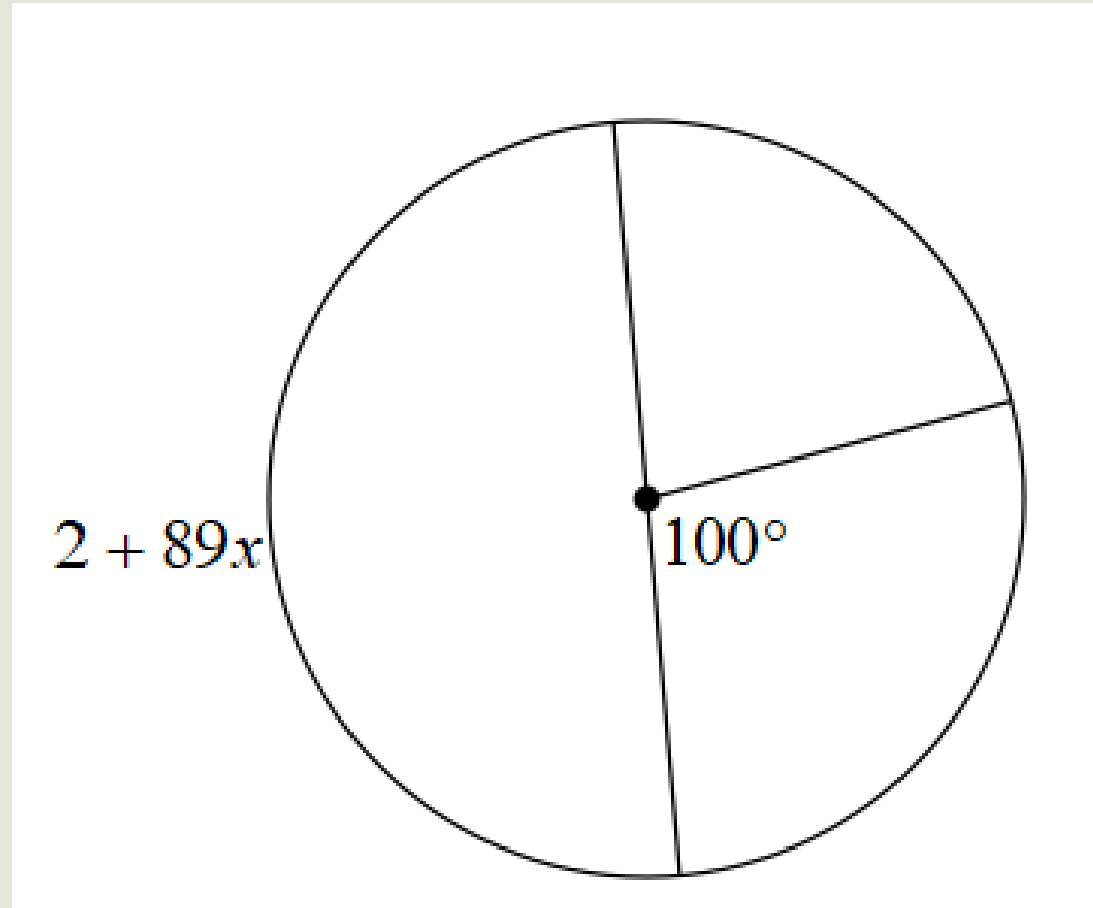
12. $m\angle MNP$

13. $m\angle LMN$



Module 15: Angles and Segments in Circles

Algebra Problems



Module 15: Angles and Segments in Circles

Algebra Problems

