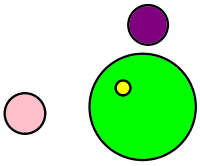
Lesson 10-1

Circles (Vocabulary)



Mar 16-9:38 AM

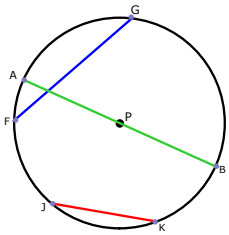
Terminology

Circle: The locus or set of all points in a plane equidistant from a given point called the center of the circle.

*A circle is named by its center point. ex.

Chord: Any segment with endpoints that are on the circle. Ex.

Diameter: A CHORD that passes through the center. Ex.



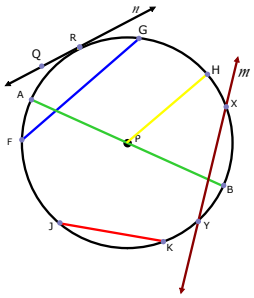
Mar 16-9:45 AM

Terminology

Radius : Any SEGMENT with endpoints that are the center and a point on the circle.

Secant :A LINE that intersects a circle in exactly two points.

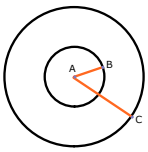
Tangent : A LINE that intersects a circle in exactly one point (called the point of tangency).



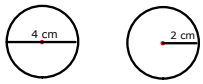
Mar 16-9:45 AM

Terminology

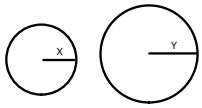
Concentric Circles: coplanar circles with a common center



Congruent Circles: Two circles with congruent radii.



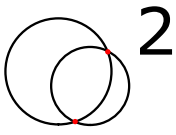
Are any two circles similar?



Dec 18-3:09 PM

Intersections

Circles can intersect in two different ways...



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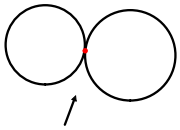

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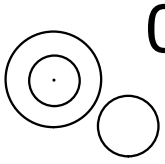
These are called tangent circles!



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...or not at all!

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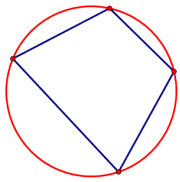
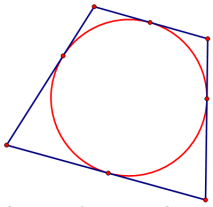
Polygons and Circles

Inscribed in...

The polygon is inscribed in the circle.



The circle is inscribed in the polygon.



Circumscribed about...(same diagrams)

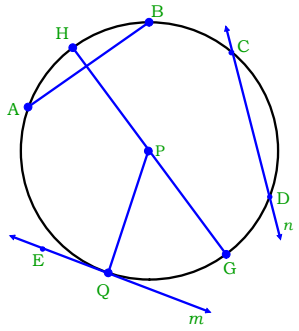
The circle is circumscribed about the polygon.

The polygon is circumscribed about the circle.

Jan 1-11:54 AM

Name a...

1. Center
2. Chord
3. Tangent
4. Secant
5. Diameter
6. Radius
7. Point of Tangency



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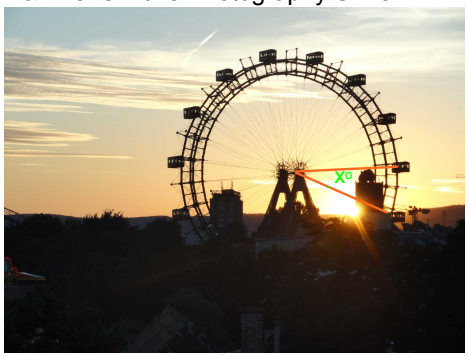
What is the longest chord in a circle?

Feb 26-5:12 PM

Lesson 10-2 Measuring Angles and Arcs
& Mrs. Smith's Photography Skills



Riesenrad in Vienna, Austria

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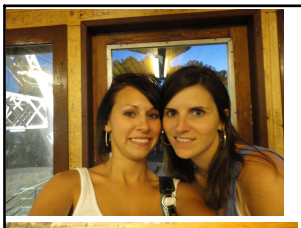

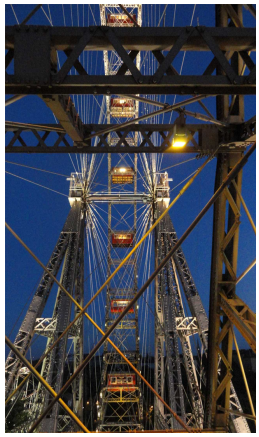

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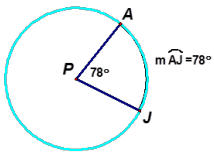
Dec 12-5:22 PM

Central Angle

- Central Angle : an angle whose vertex is the center of a circle. (ex. ∠APJ)
- The measure of a central angle is the same as the measure of its arc.
- Just remember: Central, Center, Same

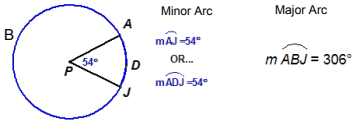


*What is the sum of the measures of the central angles of any circle?

Dec 18-3:25 PM

Arcs

- Minor arc: an arc with a measure between 0° and 180°
  - Labeled by 2 or 3 points.
  - Measure of a minor arc = measure of the arc's central angle.
- Major arc: an arc with a measure between 180° and 360°
  - ONLY Labeled by 3 points.
  - Measure of a major arc = 360° - measure of minor arc



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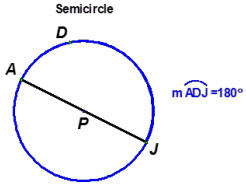
Semicircle

- Semicircle: an arc whose measure is 180°
- The endpoints are those of a diameter.



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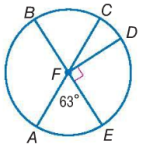
Adjacent Arcs: arcs in a circle that have exactly one point in common

Postulate 10.1 Arc Addition Postulate

Words The measure of an arc formed by two adjacent arcs is the sum of the measures of the two arcs.

Example $m\overset{\frown}{XYZ} = m\overset{\frown}{XY} + m\overset{\frown}{YZ}$



Solve for all missing arc measures!

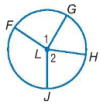
Jan 1-12:49 PM

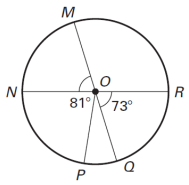
Congruent Arcs: two arcs in the same circle (or in congruent circles) that have the same measure

Theorem 10.1

Words In the same circle or in congruent circles, two minor arcs are congruent if and only if their central angles are congruent.

Example If $\angle 1 \cong \angle 2$, then $\overset{\frown}{FG} \cong \overset{\frown}{HJ}$.
If $\overset{\frown}{FG} \cong \overset{\frown}{HJ}$, then $\angle 1 \cong \angle 2$.





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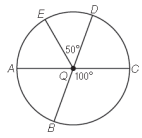
Let's try this together...

$\overline{AC}$ and $\overline{DB}$ are diameters of $\odot Q$. Identify each arc as a *major arc*, *minor arc*, or *semicircle* of the circle. Then find its measure.



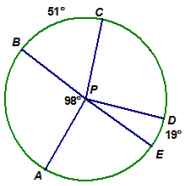
1. $m\overset{\frown}{AE}$
2. $m\overset{\frown}{AB}$
3. $m\overset{\frown}{EDC}$
4. $m\overset{\frown}{ADC}$
5. $m\overset{\frown}{ABC}$
6. $m\overset{\frown}{BC}$

Dec 18-3:25 PM

Your Turn!

Practice

1. Name a minor arc.
2. Name a major arc.
3. Name a central angle.
4. Name a semicircle.
5. Find the m∠ BPC
6. Find the m∠ APE
7. Find the m CDA

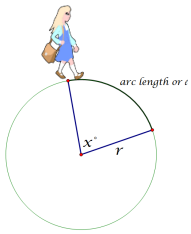


Jan 2-2:37 PM

Arc Length

MEASURE and LENGTH are different for arcs!

* Arc Length is part of the distance around the circle (circumference)

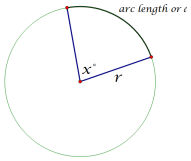


Dec 18-3:25 PM

MEASURE and LENGTH are different for arcs!

$$\text{Arc Length} = \frac{x^\circ}{360^\circ}(2\pi r)$$

x = arc measure or central angle measure



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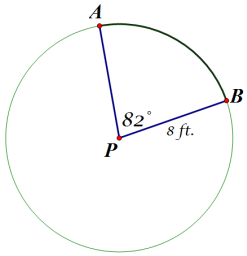
$$\text{Arc Length} = \frac{x^\circ}{360^\circ}(2\pi r)$$



What is the length of $\overset{\frown}{AB}$?

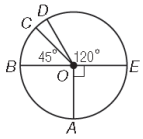
What is $m\overset{\frown}{AB}$?

Dec 18-3:48 PM

Let's try these together...

Use $\odot O$ to find the length of each arc. Round to the nearest hundredth.

1. $\overset{\frown}{DE}$ if the radius is 2 meters
2. $\overset{\frown}{DEA}$ if the diameter is 7 inches
3. $\overset{\frown}{BC}$ if $BE = 24$ feet
4. $\overset{\frown}{CBA}$ if $DO = 3$ millimeters



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