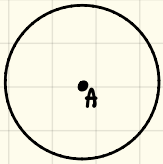
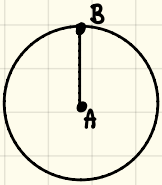
3.1 Vocabulary: Central Angles

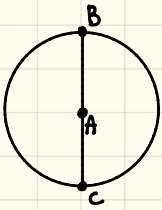
Old Circle Vocab



Circle with center A
↳ center is at an equal distance from all points on the circle.

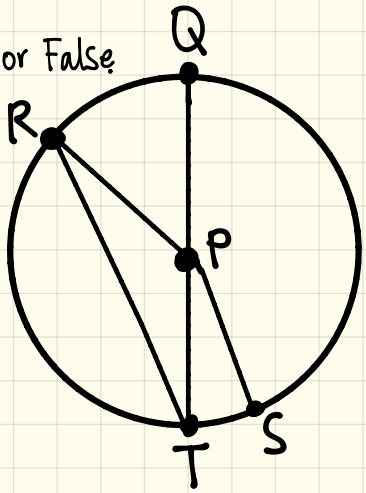


Radius $\overline{AB}$
↳ radius is the distance from the center to any point on the circle.



Diameter $\overline{BC}$
↳ diameter is the line segment connecting 2 points on the circle & passing through the center of a circle.

[Example] Determine if statements are True or False.

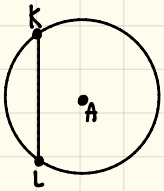


1. $\overline{RT}$ is a diameter. False.

2. $\overline{PS}$ is a radius. True.

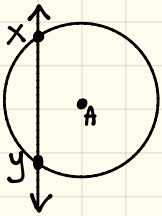
3. $\overline{QT}$ is a chord. True.

[new-A] more Circle Vocab

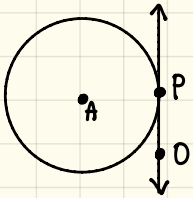


Chord $\overline{KL}$
↳ chord is a line segment whose endpoints lie on the circle.

note: A diameter is a special type of chord that goes through the center.

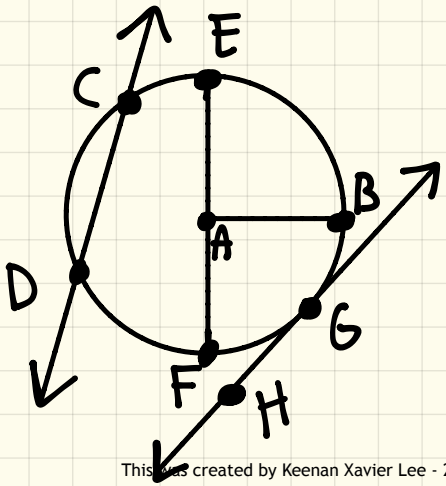


Secant $\overleftrightarrow{XY}$
↳ secant is a line that intersects at exactly 2 points.

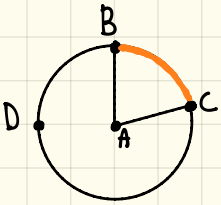


Tangent $\overleftrightarrow{PO}$
↳ tangent is a line that intersects at exactly 1 point.

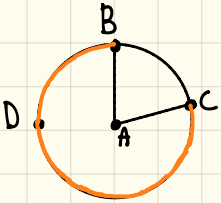
[Example] Identify the different types of segments & lines in the circle.



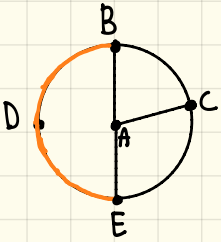
1. Center $\odot A$
2. Radius $\overline{AB}$
3. Diameter $\overline{EF}$
4. Chord $\overline{EF}$
5. Secant $\overleftrightarrow{CD}$
6. Tangent $\overleftrightarrow{GH}$



Minor Arc $\overset{\frown}{BC}$
↳ arc that is less than 180°
(2 letters notate a minor arc)

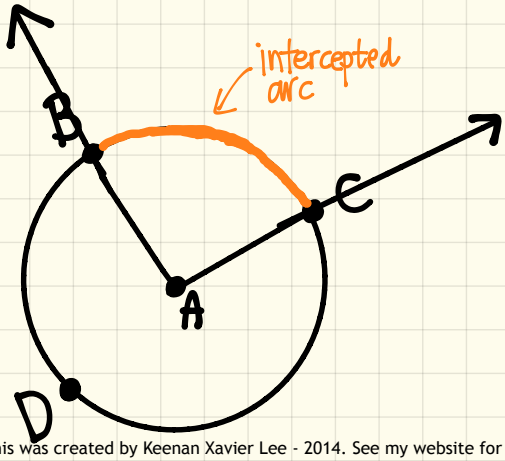


Major Arc $\overset{\frown}{BDC}$
↳ arc that is between 180° and 360°
(3 letters notate a major arc)



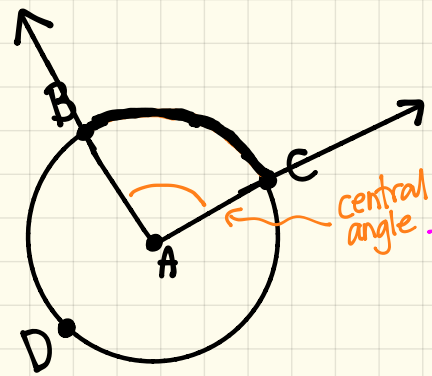
Semicircle $\overset{\frown}{BDE}$ or $\overset{\frown}{BCE}$
↳ arc that is exactly 180°
(3 letters notate a semicircle)

new - B Central Angles



Intercepted Arc is the distance between to points on the circle.
(In between points B & C lie the intercepted arc.)

Central Angle

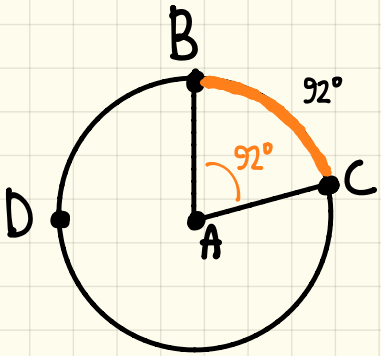


Central Angle < BAC
↳ Center Angle is an angle when 2 radii meet at the center of the circle form by an intercepted arc.

The measure of the central angle is equal to the measure of the intercepted arc.

Central Angle = Intercepted Arc

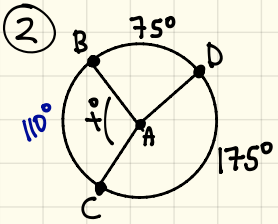
[Example] If $\overset{\frown}{BC} = 92°$. Find $m\angle BAC$.



Since $\overset{\frown}{BC}$ is the intercepted arc, the $m\angle BAC = \overset{\frown}{BC}$.

$m\angle BAC = 92°$.

[More Examples] Find the unknown.

② 

Find $m\angle BAC$.

need to find $\overset{\frown}{BC}$:

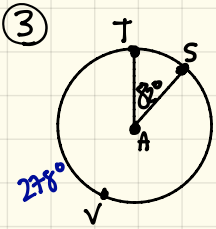
$75° + 175° + x = 360°$

$250° + x = 360°$

$x = 110°$

$m\angle BAC$ is central angle to intercepted arc $\overset{\frown}{BC}$.

$m\angle BAC = 110°$.

③ 

Find $\overset{\frown}{TVS}$.

need to find $\overset{\frown}{TS}$:

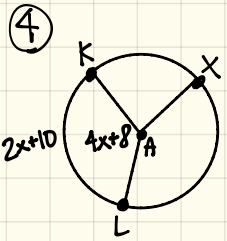
$m\angle TAS$ is central angle to intercepted arc $\overset{\frown}{TS}$.

$\overset{\frown}{TS} = 82°$

$\overset{\frown}{TVS} + \overset{\frown}{TS} = 360°$

$\overset{\frown}{TVS} + 82° = 360°$

$\overset{\frown}{TSV} = 278°$

④ 

Find $m\angle KAL$.

$4x + 8 = 2x + 10$

$-2x \quad = -2x$

$2x + 8 = 10$

$-8 = -8$

$\frac{2x}{2} = \frac{6}{2}$

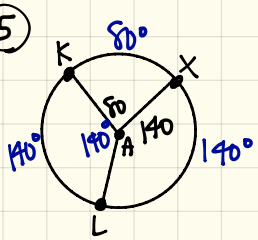
$x = 3$

$m\angle KAL = 4x + 8$

$= 4(3) + 8$

$= 20°$

(5)



Find $\overset{\frown}{LKX}$.

- $m\angle KAL =$
  $80° + 140° + m\angle KAL = 360°$
  $220° + m\angle KXL = 360°$
  $m\angle KXL = 140°$
- $\overset{\frown}{KL}$ is intercepted arc of central angle $m\angle KAL$. $\overset{\frown}{KL} = m\angle KAL$
- $\overset{\frown}{LKX} = \overset{\frown}{LK} + \overset{\frown}{KX}$
  $= 140° + 80°$
  $= 220°$