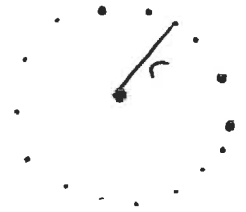


Objectives:

1. The student will identify segments and lines related to circles.
2. The student will apply properties of tangents to circles.
3. The student will be able to apply properties of arcs of circles.
4. The student will be able to apply properties of chords of circles.

Circle: the set of all points in a plane at a given distance from a given point

Radius: given distance from the center



Congruent Circles: two ~~or~~ ^{or} more circles that have the same radius

Diameter: a line segment that passes through the center of the circle to 2 points on the circle

Chord: a line segment whose endpoints lie on a circle

Diameter vs Chord

diameter is a chord * diameter must go through center

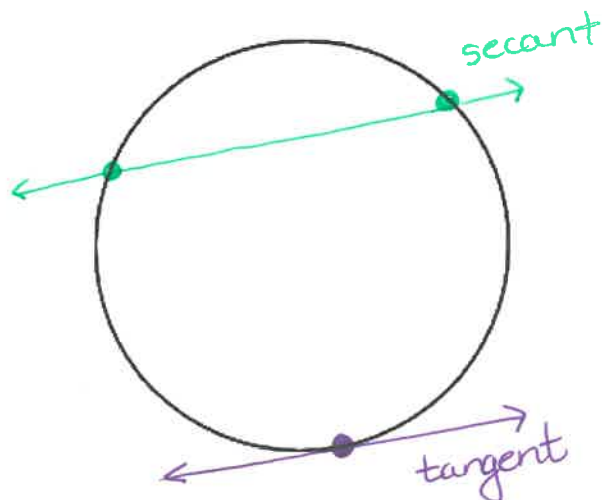
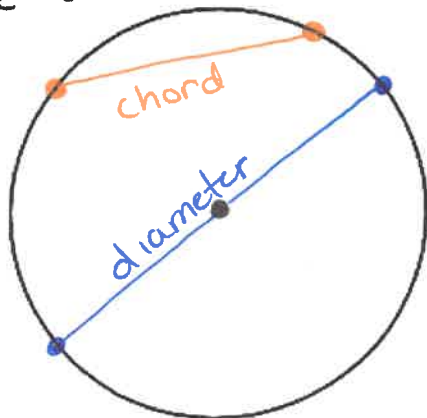
Secant: a line that intersects the circle at 2 points

Tangent: a line that intersects the circle at exactly 1 point

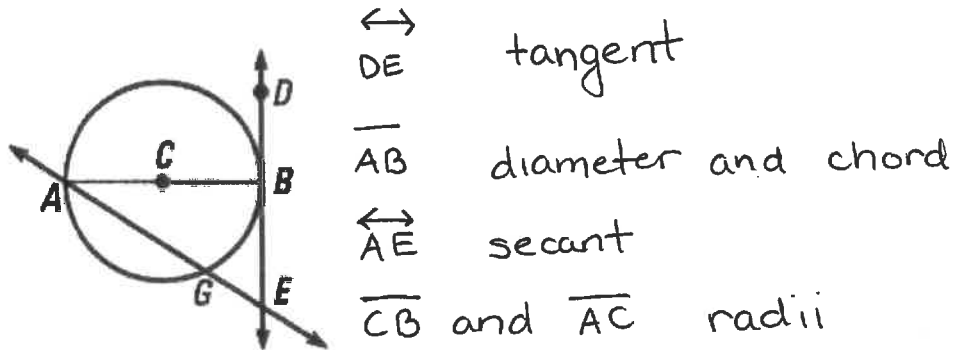
Secant vs Tangent

2 pts 1 pt

pt of tangency:
where the tangent touches the circle



1. Identify special segments:



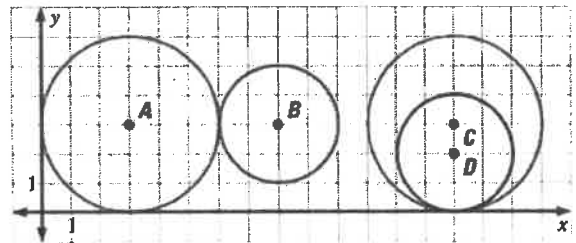
2. Use the diagram to find the given lengths:

- Radius of $\odot A$
- Diameter of $\odot A$
- Center of $\odot B$

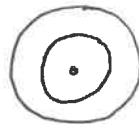
radius of $\odot A = 3$

diameter of $\odot A = 6$

center of $\odot B = (8, 3)$



- Concentric Circles** two or more coplanar circles that share the same center

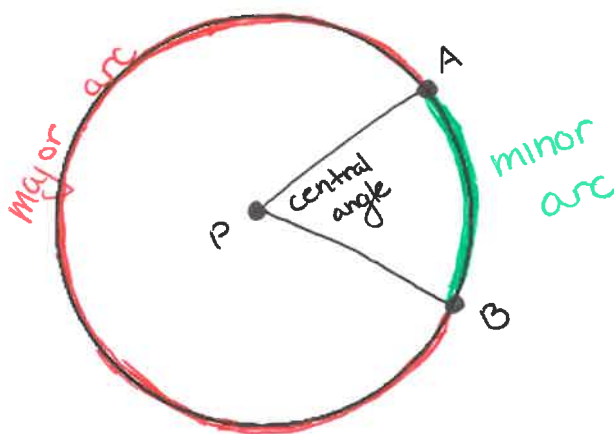


Central Angle: an angle whose vertex is the center of the circle

Minor Arc: formed when the central angle is less than 180°

Major Arc: the larger arc (not the minor arc)

Semicircle: when the endpoints of an arc are the endpoints of a diameter

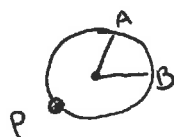


Naming Arcs

Minor arc: named by endpoints

\widehat{AB}

Major arc & semicircle: named by endpoints AND additional pt on the arc

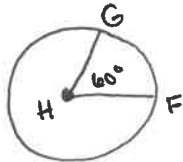


\widehat{APB}

Measuring Arcs:

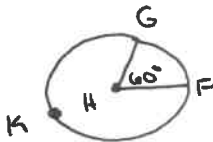
- Measure of a minor arc:

defined to be the measure of its central angle



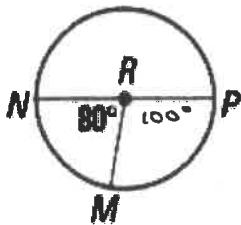
$$m\widehat{GF} = m\angle GHF = 60^\circ$$

- Measure of a major arc: the difference between 360° and the measure of its associated minor arc



$$\begin{aligned} m\widehat{GKF} &= 360 - m\angle GHF \\ &= 360 - 60 \\ &= 300^\circ \end{aligned}$$

1. Find the measure of each of the arcs in $\odot R$



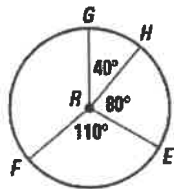
$$m\widehat{NM} = 80^\circ$$

$$m\widehat{PM} = 100^\circ$$

$$m\widehat{NPM} = 280^\circ$$

2. Find the measure of each arc:

a.



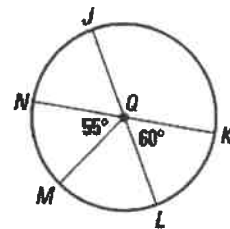
$$m\widehat{GH} = 40^\circ$$

$$m\widehat{FE} = 110^\circ$$

$$m\widehat{HE} = 80^\circ$$

$$\begin{aligned} m\widehat{FG} &= 360 - 110 - 40 - 80 \\ &= 130^\circ \end{aligned}$$

b.



$$m\widehat{NM} = 55^\circ$$

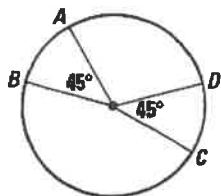
$$m\widehat{KL} = 60^\circ$$

$$m\widehat{ML} = 75^\circ$$

$$m\widehat{JN} = 60^\circ$$

$$m\widehat{JK} = 120^\circ$$

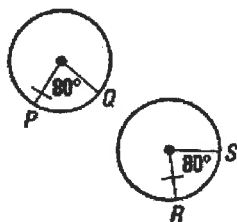
3. Find the measure of \widehat{AB} and \widehat{DC}



$$m \widehat{AB} = 45^\circ$$

$$m \widehat{DC} = 45^\circ$$

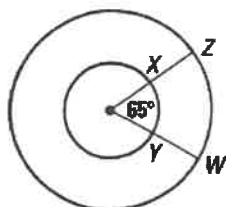
4. Find the measure of \widehat{PQ} and \widehat{SR}



$$m \widehat{PQ} = 80^\circ$$

$$m \widehat{SR} = 80$$

5. Find the measure of \widehat{XY} and \widehat{ZW}



$$m \widehat{XY} = 65^\circ$$

$$m \widehat{ZW} = 65^\circ$$

