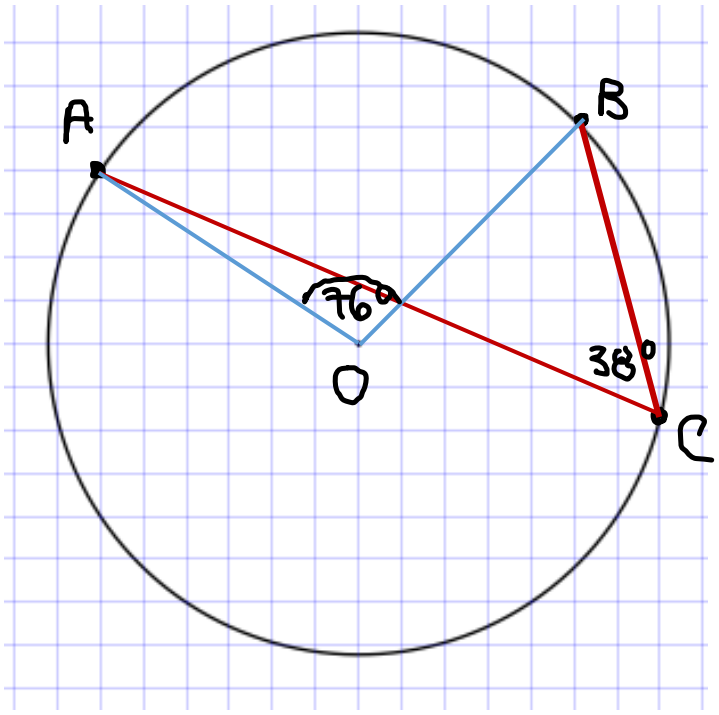
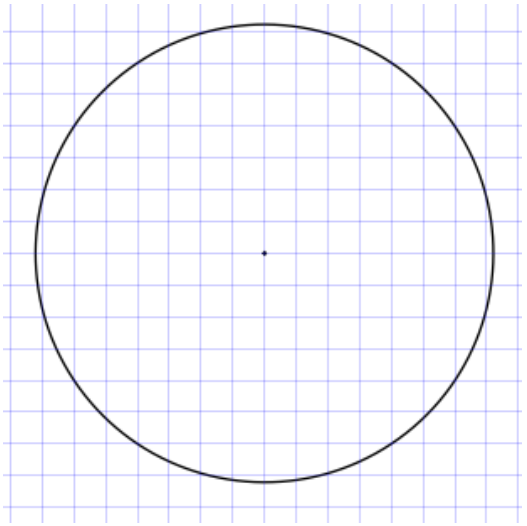
Unit 8: Circle Geometry Name: _____

8.3 Properties of Angles in a Circle – Notes

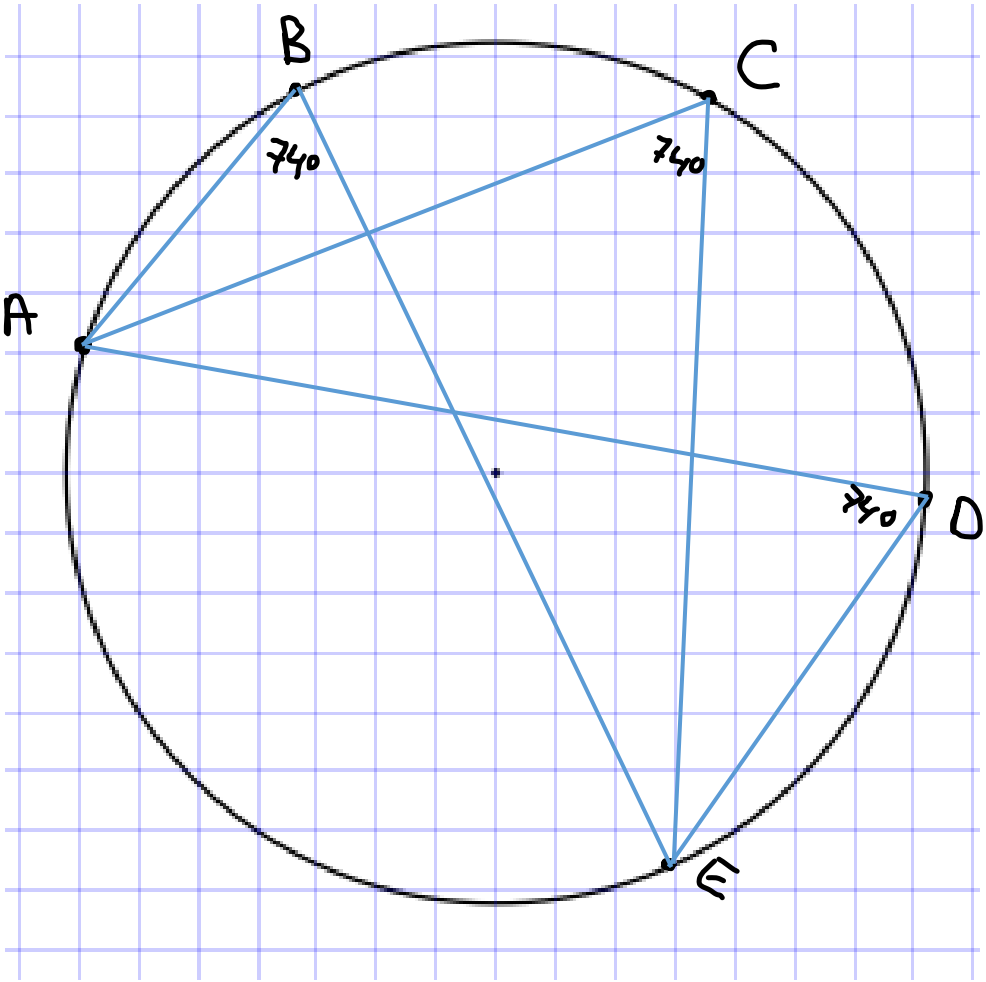
Investigate

- Label the center of the circle O.
- Choose two points A and B on the circle. Choose a third point C on the circle. Join AC and BC.
- Measure <ACB. Record your measurements: 38°
- Join AO and OB.
- Measure the smaller <AOB. Record your measurements: 76°
- Repeat the previous step for other points A, B, and C on the circle and for other circles.



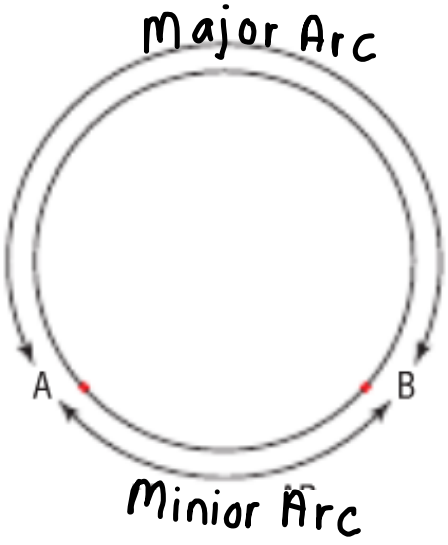


- Mark 5 points A, B, C, D, E, in order, on the circle.
- Join AB, AC, AD, and EB, EC, ED.
- Measure <ABE, <ACE, <ADE. Record your measurements.



NOTES:

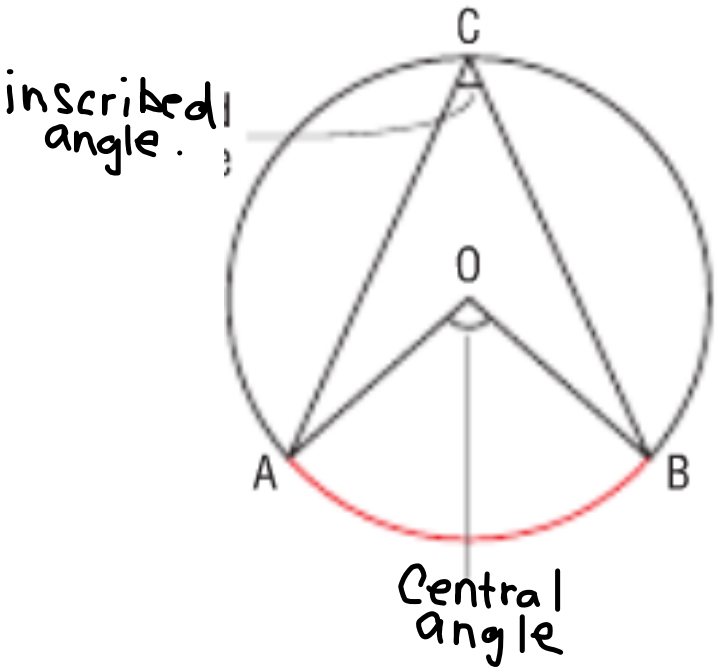
- A section of the circumference of a circle is an arc.
- The shorter arc AB is the minor arc.
- The longer arc AB is the major arc.



- The angle formed by joining the endpoints of an arc to the centre of the circle is a Central angle; ∠AOB is a central angle.

- The angle formed by joining the endpoints of an arc to a point on the circle is an inscribed angle; ∠ACB is an inscribed angle.

- The inscribed and central angles in this circle are Subtended by the minor arc AB.



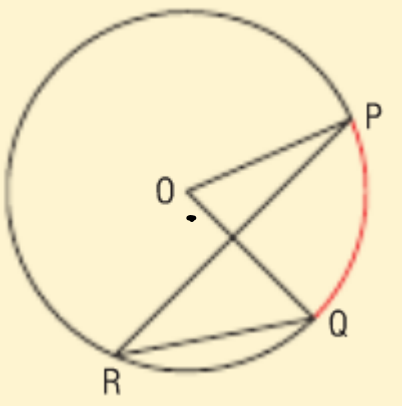
Central Angle and Inscribed Angle Property

In a circle, the measure of a central angle subtended by an arc is twice the measure of an inscribed angle subtended by the same arc.

$\angle POQ = 2\angle PRQ$

or

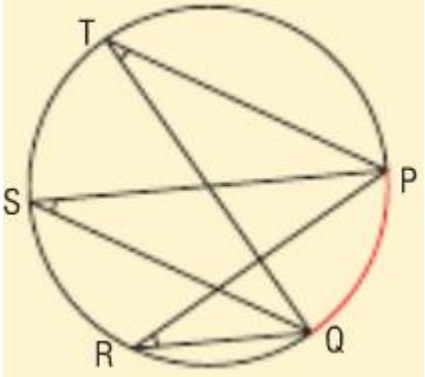
$\angle PRQ = \frac{1}{2}\angle POQ$



Inscribed Angles Property

In a circle, all inscribed angles subtended by the same arc are congruent (equal).

$\angle PTQ = \angle PSQ = \angle PRQ$



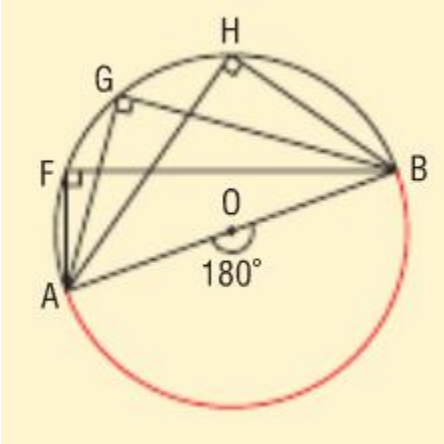
Angles in a Semicircle Property

All inscribed angles subtended by a semicircle are right angles.

$\angle AOB = 180°$

$\angle AFB = \angle AGB = \angle AHB = \frac{1}{2}(180°)$

$= 90°$



We say: The angle inscribed in a semicircle is a right angle.

We also know that if an inscribe angle is 90°, then it is subtended by a semicircle.