

Math 9

May 29, 2014

Dec. 17, 2018

8.3

Properties of Angles in a Circle

May 28, 2015

May 22, 2019

Mini Lesson #1:

TASK 1, 2 and 3

A soccer player attempts to get a goal. In a warm-up, players line up parallel to the goal line to shoot on the net. Does each player have the same shooting angle? Is there an arrangement that allows the players to be spread out but still have the same shooting angle?

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Discover a Pattern You will need a protractor

$m\angle B$ 97° $m\angle A$ 48°	
$m\angle B$ 120 110 $m\angle A$ 62 60	
$m\angle B$ 121 $m\angle A$ 62	
$m\angle B$ 180° $m\angle A$ 90°	

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Inscribed angle *Central angle*

Vocabulary

Chord: A line segment that joins two points on a circle

Subtended: Cross or intersect the circle

Inscribed: An angle in a circle with its vertex and the endpoints of its arms on the circle.

Central Angle: An angle whose arms are radii of a circle.

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► Construct another large circle.
 Mark 5 points A, B, C, D, and E, in order, on the circle.
 Join AB, AC, AD, and EB, EC, ED.
 Measure $\angle ABE$, $\angle ACE$, and $\angle ADE$.
 Record your measurements.

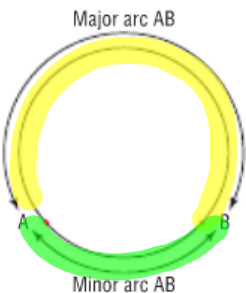
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TASK 2 & 3 - fill in your notes

Connect

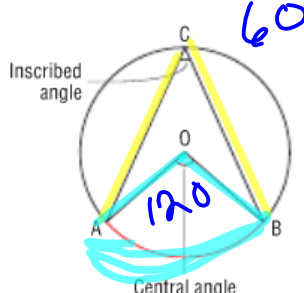
► A section of the circumference of a circle is an **arc**.
 The shorter arc AB is the **minor arc**.
 The longer arc AB is the **major arc**.



► The angle formed by joining the endpoints of an arc to the centre of the circle is a **central angle**;
 $\angle AOB$ is a central angle.

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

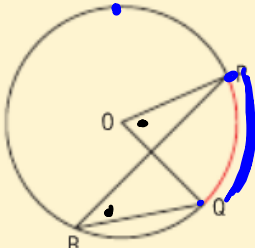
The inscribed and central angles in this circle are subtended by the minor arc AB.



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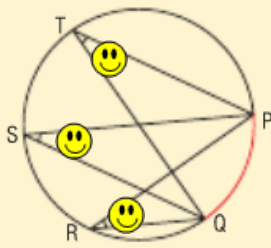
Properties

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



The above property is true for any inscribed angle.

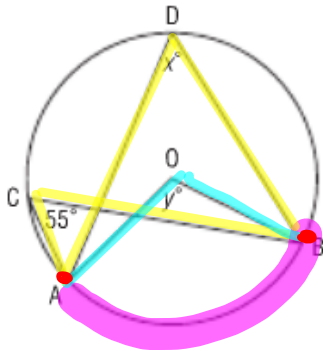
► **Inscribed Angles Property**
 In a circle, all inscribed angles subtended by the same arc are congruent.
 $\angle PTQ = \angle PSQ = \angle PRQ$



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Example 1 Using Inscribed and Central Angles

Point O is the centre of a circle.
Determine the values of x° and y° .

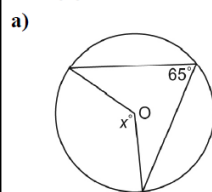
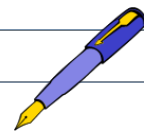


$x^\circ = 110^\circ$
Subtended by the same minor arc AB
 $y^\circ = 110^\circ$ ($2 \times 55^\circ$)
Subtended by the same minor arc AB

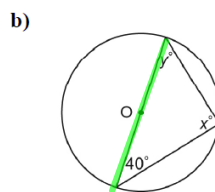
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Practice

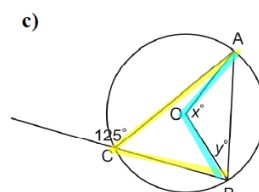
Point O is the centre of each circle.
Determine the values of x° and y° .
Justify your solutions.



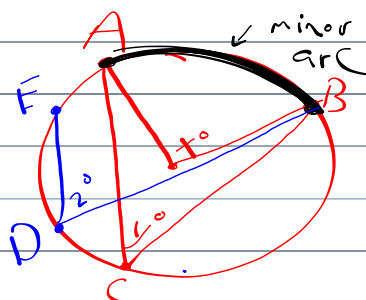
$x^\circ = 130^\circ$
($2 \times 65^\circ$)



$y = 50^\circ$
 $x = 90^\circ$



$x = 110^\circ$
($2 \times 55^\circ$)
 $y = 35^\circ$
 $\frac{180}{2} = 90$
 $90 - 55 = 35$
 $y = 35^\circ$



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End of mini lesson #1

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