HAPPY INTERNATIONAL DAY AGAINST HOMOPHOBIA AND TRANSPHOBIA! :)

MAY 17, 2017

UNIT 8: CIRCLE GEOMETRY

8.3: PROPERTIES OF ANGLES IN A CIRCLE

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MATH 9

WHAT'S THE POINT OF TODAY'S LESSON?

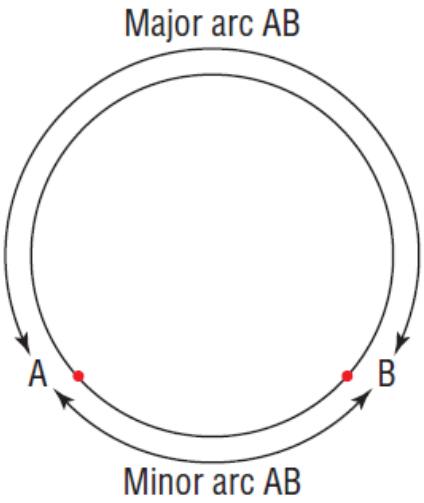
We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Shape and Space 1" OR "SS1" which states:

"Solve problems and justify the solution strategy using circle properties, including:

* **the perpendicular from the centre of a circle to a chord bisects the chord;**
* **the measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc;**
* **the inscribed angles subtended by the same arc are congruent;**
* **a tangent to a circle is perpendicular to the radius at the point of tangency."**

VOCABULARY:

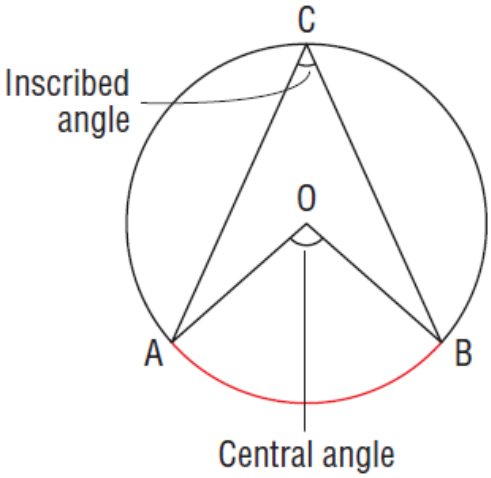
1. **ARC: A section of the circumference of a circle. In the diagram below, the shorter arc AB is the MINOR ARC, and the longer arc AB is the MAJOR ARC.**



VOCABULARY:

2. **CENTRAL ANGLE: The angle formed by joining the endpoints of an arc to the centre of the circle. (This is done using 2 radii.)**

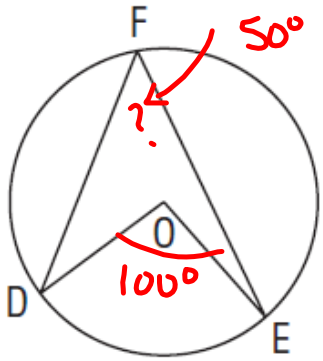
3. **INSCRIBED ANGLE: The angle formed by joining the endpoints of an arc to a point on the circle.**



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

VOCABULARY:

4. CENTRAL ANGLE AND INSCRIBED ANGLE PROPERTY (CIAP): 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.

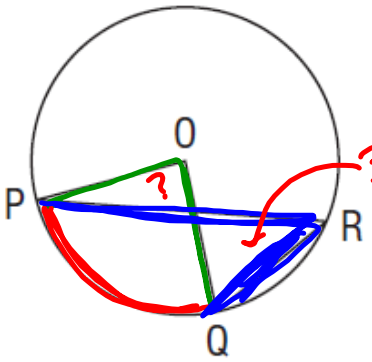


$\angle O = 2\angle F$

OR

$\angle F = \frac{1}{2}\angle O$

$\angle DFE = 50°$ (CIAP)



$\angle O = 2\angle R$

OR

$\angle R = \frac{1}{2}\angle O$

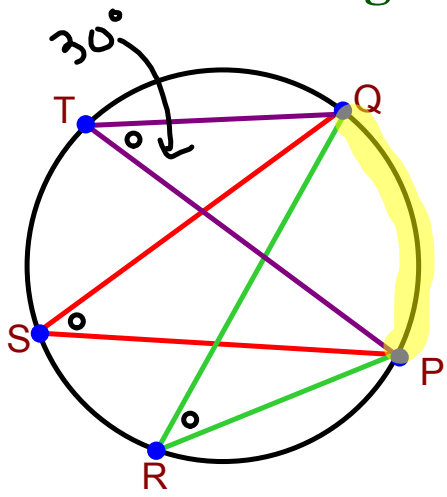
$\angle POQ$

$\angle PRQ$

$\angle POQ = 66°$ (CIAP)

VOCABULARY:

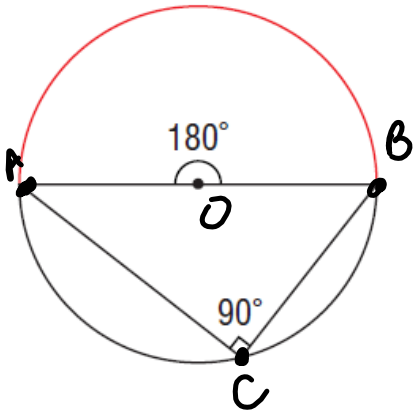
5. **INSCRIBED ANGLES PROPERTY (IAP): In a circle, ALL inscribed angles subtended by the SAME arc are congruent (equal).**

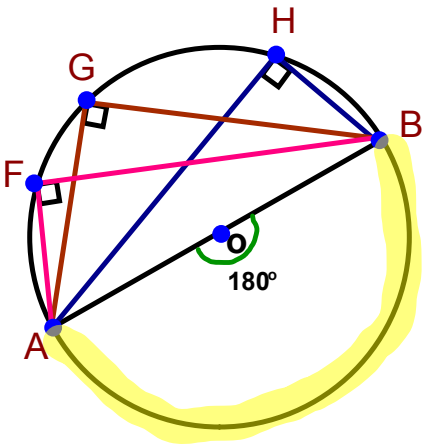


$\angle PTQ = \angle PSQ = \angle PRQ = 30°$ (IAP)

VOCABULARY:

6. ANGLES IN A SEMICIRCLE PROPERTY (ASP): All inscribed angles subtended by a semicircle are RIGHT angles.





This makes sense - think of CIAP; an inscribed angle is half the central angle when the are subtended by the same arc.

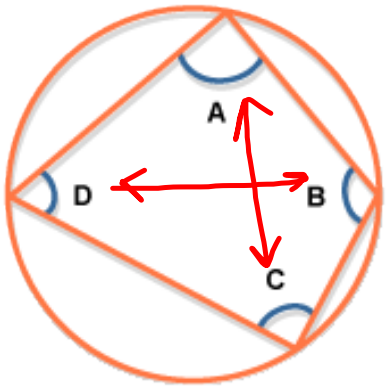
$\angle ACB = 90° (ASP)$

$\angle AFB = \angle AGB = \angle AHB = 90° (ASP)$

VOCABULARY:

7. OPPOSITE ANGLES IN A CYCLIC QUADRILATERAL PROPERTY (CQP):

The opposite angles in a cyclic quadrilateral (a quadrilateral whose vertices all touch the circumference of a circle) add up to 180^{O}.

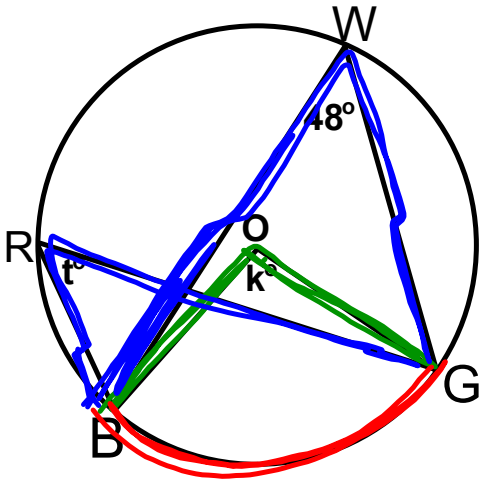


$\angle A + \angle C = 180^{O}$

$\angle B + \angle D = 180^{O}$

EXAMPLE: USING INSCRIBED AND CENTRAL AN

Point O is the center of a circle.
Determine the values of k° and t°.

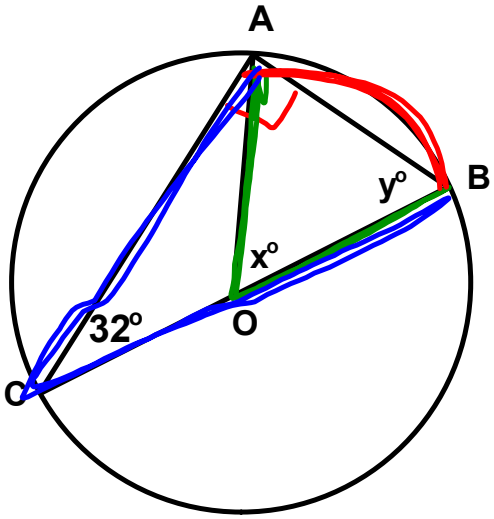


$\angle BRG = 48°$ (IAP)

$\angle BOG = 96°$ (CIAP)

EXAMPLE: APPLYING THE ANGLES IN A SEMICIRCLE P

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



METHOD #1

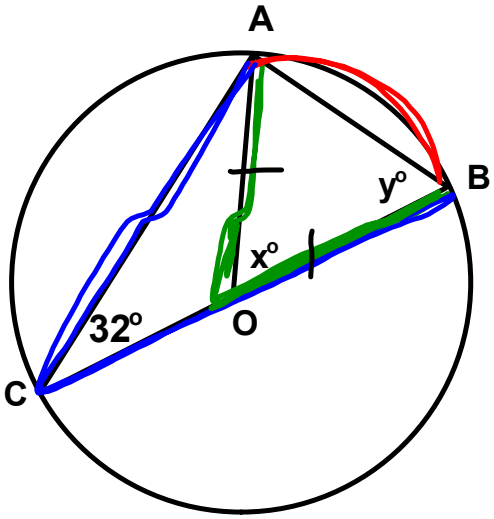
$\angle BAC = 90°$ (ASP)

$\angle ABC = 58°$ (SATT)

$\angle AOB = 64°$ (CIAP)

EXAMPLE: APPLYING THE ANGLES IN A SEMICIRCLE P

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



METHOD # 2

$\angle AOB = 64°$ (CIAP)

$\angle ABO = 58°$ (ITT/SAT)

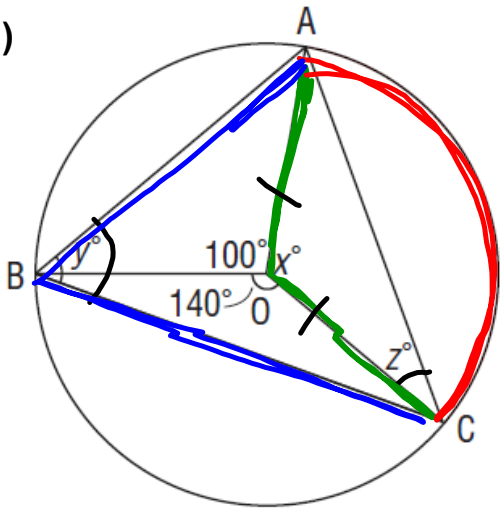
EXAMPLE: DETERMINING ANGLES IN AN INSCRIBED TI

Determine the values of x°, y°, and z°.
(HINT: There are 360° in a circular rotation.)

$\angle AOC = 120°$ (360−240)

$\angle ABC = 60°$ (CIAP)

$\angle ACO = 30°$ (ITT/SATT)



CONCEPT REINFORCEMENT:

MMS9:

PAGE 410: #3 TO #5

PAGE 411: #6 & #11

Attachments

Worksheet - Angles in a Circle.doc