MAY 19, 2016

UNIT 8: CIRCLE GEOMETRY

8.3: PROPERTIES OF ANGLES IN A CIRCLE

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MATH 9

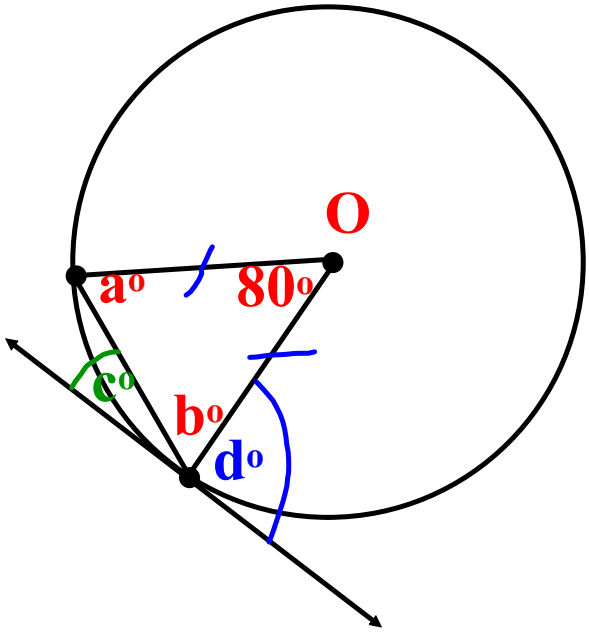
WHAT'S THE POINT OF TODAY'S LESSON?

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."**

WARM-UP: Find angles a, b, c and d.



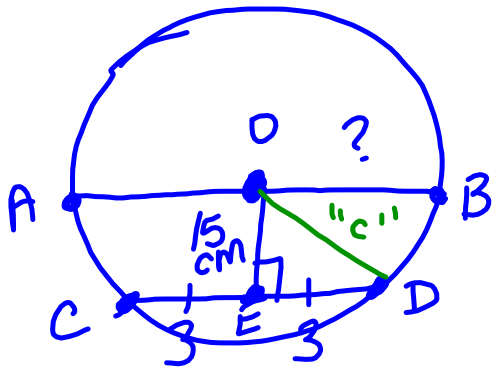
$a^o = b^o = 50^o$ (ITT / SATT)

$c^o = 40^o$ (TRP)

$d^o = 90^o$ (TRP)

HOMEWORK QUESTIONS???
(pages 390/391, #18 & #20:
page 399, #14, #17, #18 & #19)

14.



$\angle DEO = 90°$ (PCP)

$CE = DE = 3cm$ (PCP)

$BO = ?$

$a^2 + b^2 = c^2$

$3^2 + 15^2 = c^2$

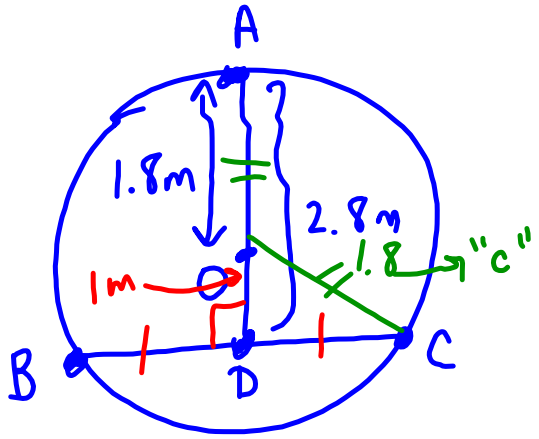
$9 + 225 = c^2$

$\sqrt{234} = \sqrt{c^2}$

$15.3cm \doteq c$ (Radius)

HOMEWORK QUESTIONS???
(pages 390/391, #18 & #20: page 399, #14, #17, #18 & #19)

18.



$\angle CDO = 90°$ (PCP)

$BD = CD$ (PCP)

$DO = AD - AO$

$= 2.8 - 1.8$

$= 1\text{ m}$

$a^2 + b^2 = c^2$

$a^2 + 1^2 = 1.8^2$

$a^2 + 1 = 3.24$

$\sqrt{a^2} = \sqrt{2.24}$

$a \doteq 1.4967\text{ m}$ (CD)

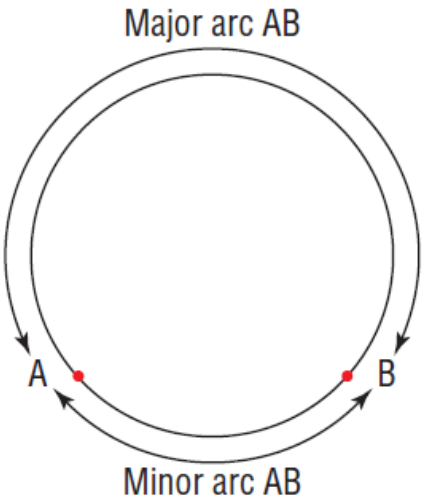
$BC = 2(CD)$

$\doteq 2(1.4967)$

$\doteq 3\text{ m}$

VOCABULARY:

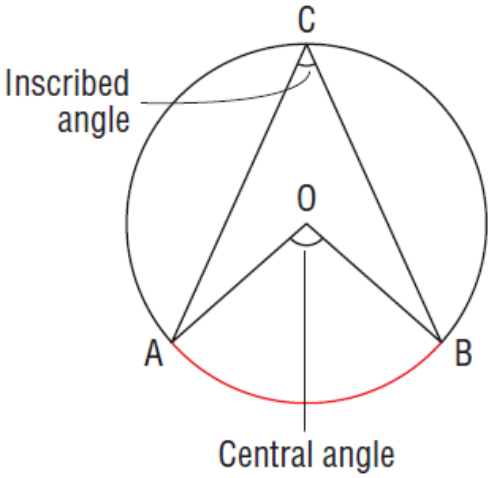
1. **ARC: A section of the circumference of a circle. In the diagram below, the shorter arc AB is the MINOR ARC, and the longer arc AB is the MAJOR ARC.**



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.)**

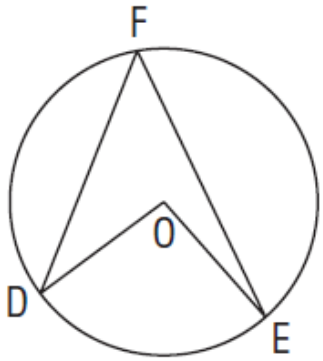
3. **INSCRIBED ANGLE: The angle formed by joining the endpoints of an arc to a point on the circle.**



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

VOCABULARY:

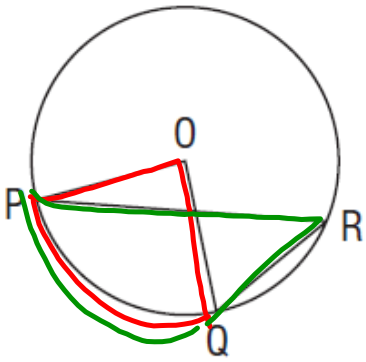
4. CENTRAL ANGLE AND INSCRIBED ANGLE PROPERTY (CIAP): In a circle, the measure of a central angle subtended by an arc is TWICE the measure of an inscribed angle subtended by the SAME arc.



$\angle O = 2\angle F$

OR

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



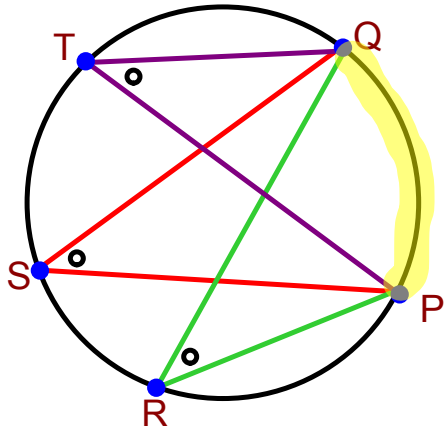
$\angle O = 2\angle R$

OR

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

VOCABULARY:

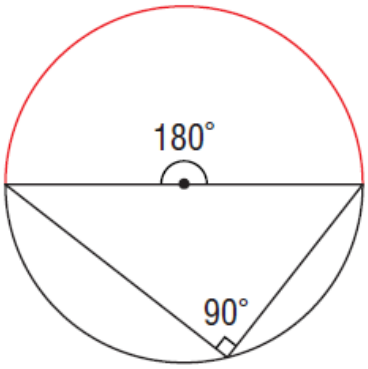
5. INSCRIBED ANGLES PROPERTY (IAP): In a circle, ALL inscribed angles subtended by the SAME arc are congruent (equal).

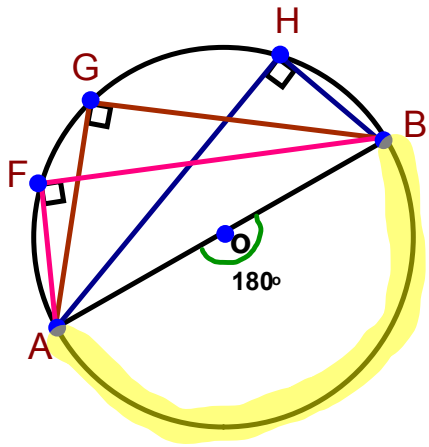


$\angle R = \angle S = \angle T$

VOCABULARY:

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



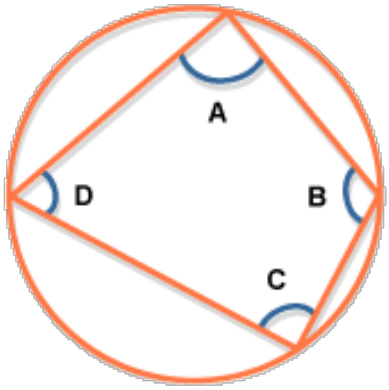


This makes sense - think of CIAP; an inscribed angle is half the central angle when the are subtended by the same arc.

$\angle F = \angle G = \angle H = 90^\circ$

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}.



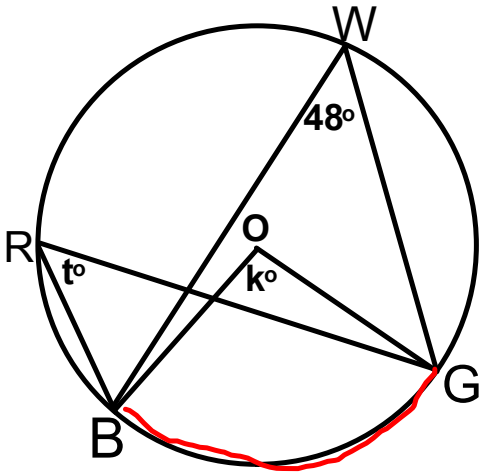
$\angle A + \angle C = 180^{o}$

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

EXAMPLE: USING INSCRIBED AND CENTRAL AN

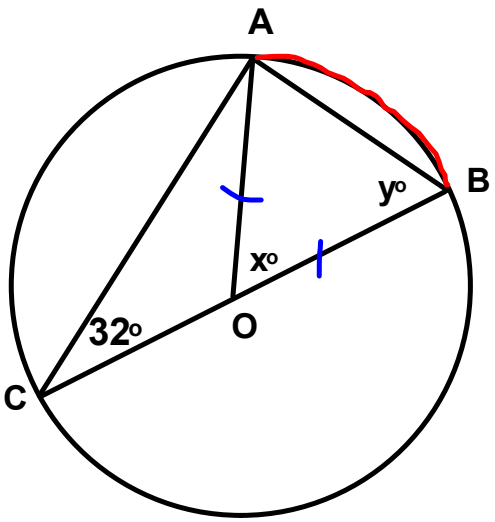
Point O is the center of a circle.
Determine the values of k and t°.

< t = 48° (IAP)
< k = 96° (CIAP)



EXAMPLE: APPLYING THE ANGLES IN A SEMICIRCLE P

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



$\angle x = 64^o$ (CIAP)

$\angle A = 90^o$ (ASP)
$\angle y = 58^o$ (SATT)

OR

$\angle y = 58^o$ [ITT/SATT; $(180^o - 64^o)/2$]

CONCEPT REINFORCEMENT:

MMS9:

PAGE 410: #3 TO #5

PAGE 411: #6

Attachments

Worksheet - Angles in a Circle.doc