MAY 20, 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?

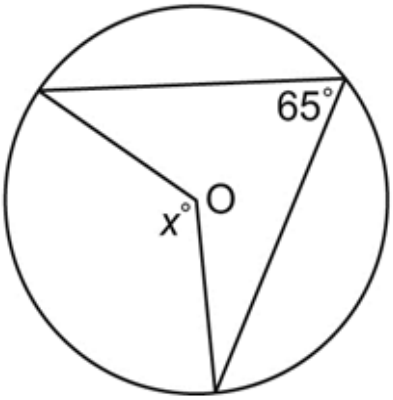
We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Shape and Space 1" OR "SS1" which states:

"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."**

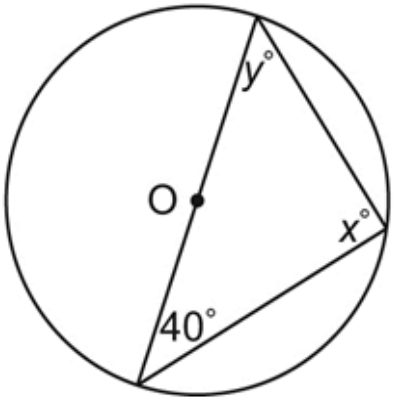
WARM-UP: O is the centre of each circle. Determine the values of x^o and y^o. Justify your answers.

a)



$x^o = 130^o$ (CIAP)

b)

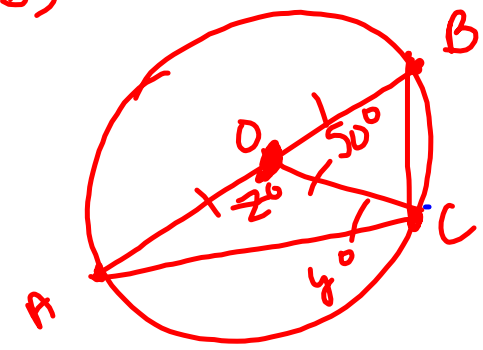


$x^o = 90^o$ (ASP)

$y^o = 50^o$ (SATT)

HOMEWORK QUESTIONS???
(pages 410 / 411, #3 TO #6)

5 b) c a b



$\angle z = 130°$ $(180° - 50°)$

$\angle y = 25°$ (ITT/SATT)

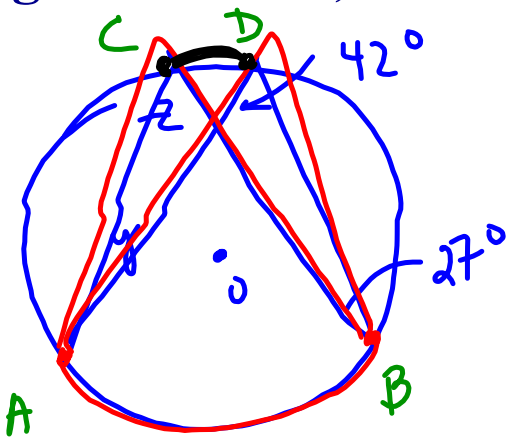
$\angle BAC = 25°$ (CIAP)

$\angle y = 25°$ (ITT)

$\angle z = 130$ (SATT)

HOMEWORK QUESTIONS???
(pages 410 / 411, #3 TO #6)

5.c)



$\angle z = 42°$ (IAP)

$\angle y = 27°$ (IAP)

$\angle z = \angle DCB$

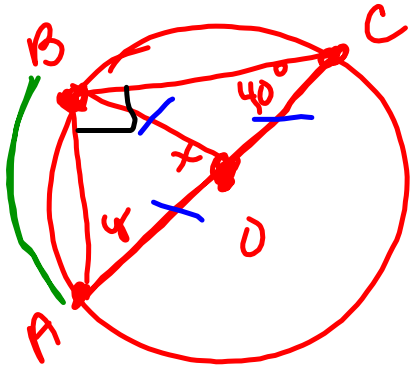
$42° = \angle ADB$

$\angle y = \angle CAD$

$27° = \angle CBD$

HOMEWORK QUESTIONS???
(pages 410 / 411, #3 TO #6)

b. a)



$\angle ABC = 90°$ (ASP)

$\angle y = 50°$ (SATT)

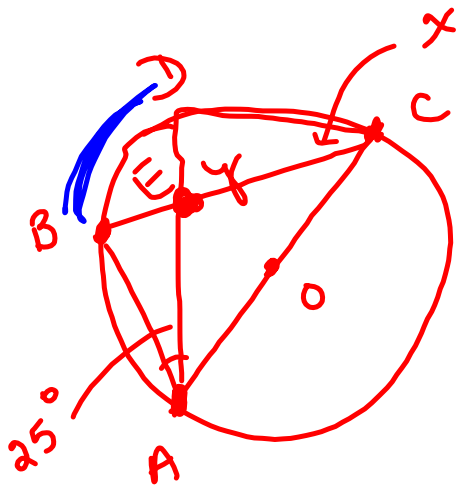
$\angle x = 80°$ (CIAP)

$\angle x = 80°$ (CIAP)

$\angle y = 50°$ (ITT | SATT)

HOMEWORK QUESTIONS???
(pages 410 / 411, #3 TO #6)

6.b)



$\angle ABC = \angle ADC = 90°$ (ASP)

$\angle AEB = 65°$ (SATT)

$\angle y = 65°$ (OAT)

$\angle x = 25°$ (SATT)

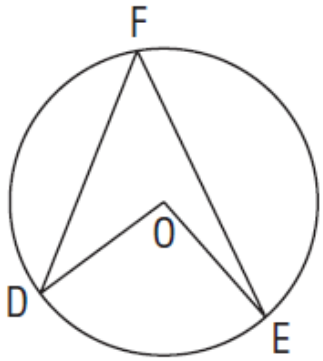
$\angle x = 25°$ (IAP)

$\angle ADC = 90°$ (ASP)

$\angle y = 65°$ (SATT)

VOCABULARY:

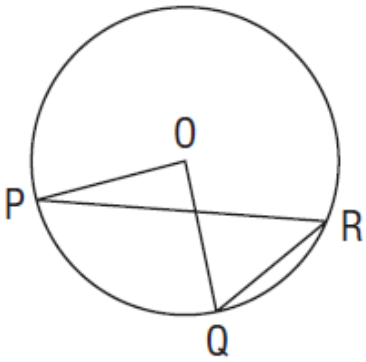
4. CENTRAL ANGLE AND INSCRIBED ANGLE PROPERTY (CIAP): In a circle, the measure of a central angle subtended by an arc is TWICE the measure of an inscribed angle subtended by the SAME arc.



$\angle O = 2\angle F$

OR

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



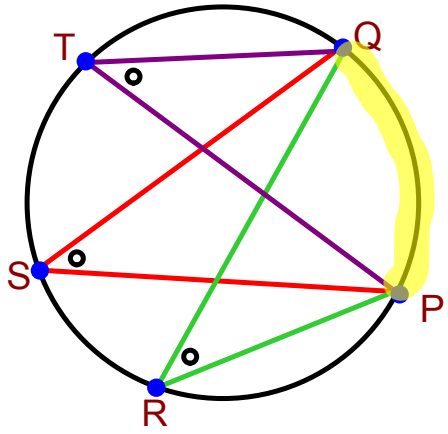
$\angle O = 2\angle R$

OR

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

VOCABULARY:

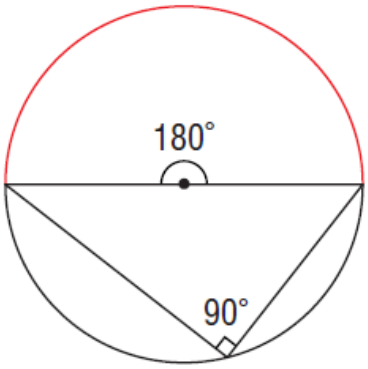
5. INSCRIBED ANGLES PROPERTY (IAP): In a circle, ALL inscribed angles subtended by the SAME arc are congruent (equal).

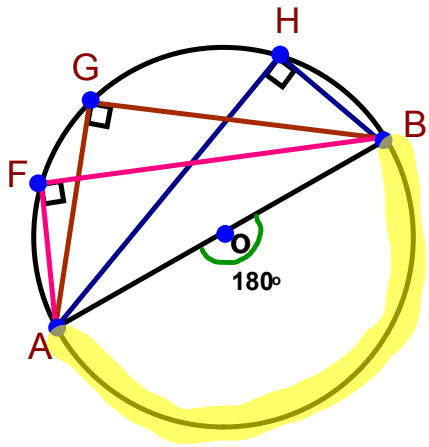


$\angle R = \angle S = \angle T$

VOCABULARY:

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



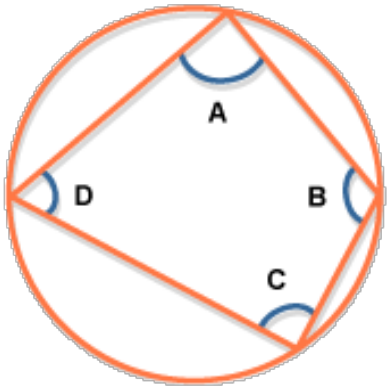


This makes sense - think of CIAP; an inscribed angle is half the central angle when the are subtended by the same arc.

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

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}.



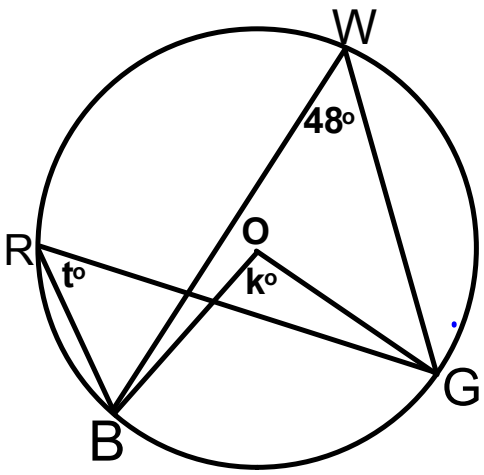
$\angle A + \angle C = 180^{o}$

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

EXAMPLE: USING INSCRIBED AND CENTRAL AN

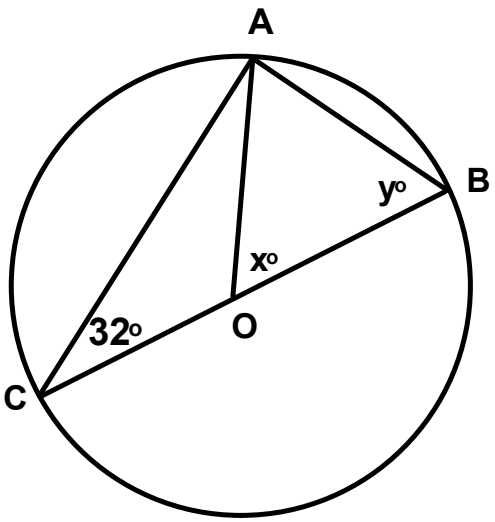
Point O is the center of a circle.
Determine the values of k and t°.

< 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; $(180^o - 64^o)/2$]

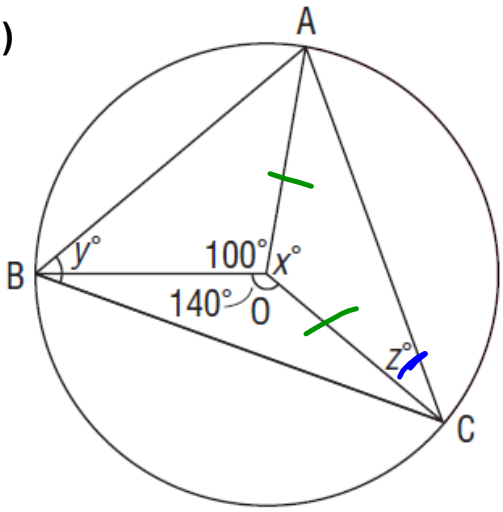
EXAMPLE: DETERMINING ANGLES IN AN INSCRIBED TI

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

$\angle x = 120^o$ [$360^o - (100^o + 140^o)$]

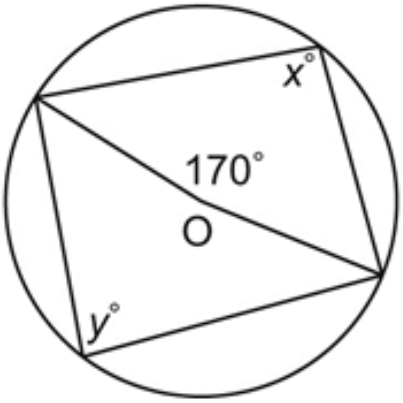
$\angle y = 60^o$ (CIAP)

$\angle z = 30^o$ [ITT / SATT; $(180^o - 120^o)/2$]



EXAMPLE: DETERMINING ANGLES IN A CYCLIC QU

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



<y = 85° (CIAP)

<x = 95° (CQP)

CONCEPT REINFORCEMENT:

MMS9:

PAGE 411: #9 & #11

PAGE 419: #9 & #10

PAGE 420: #2

PAGE 466: #20

PAGE 467: #23

Attachments

Worksheet - Angles in a Circle.doc