MAY 16, 2016

UNIT 8: CIRCLE GEOMETRY

8.2: PROPERTIES OF CHORDS 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:

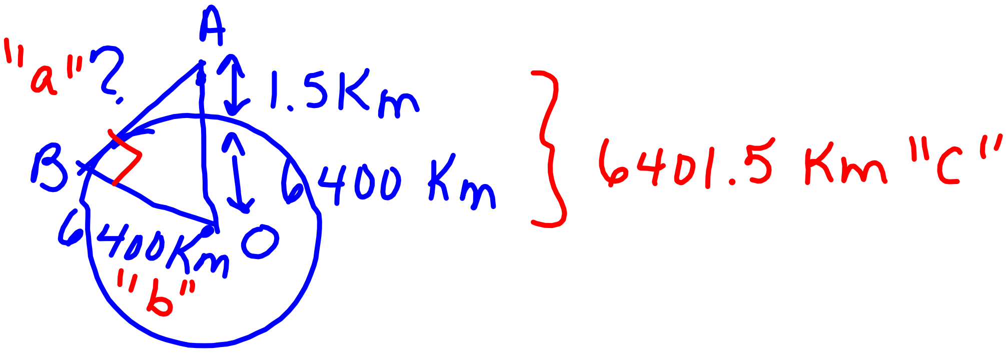
"Solve problems and justify the solution strategy using circle properties, including:

*** 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."**

HOW DID YOU MAKE OUT WITH THE 8.1 / 8.2 WORKSHEETS ON FRIDAY?

WARM-UP QUESTIONS:
PAGE 389, #12 ; PAGE 397, #4a

12.



$\angle ABO = 90^\circ$ (TRP)

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

$a^2 + 6400^2 = 6401.5^2$

$a^2 + 40\,960\,000 = 40\,979\,202.25$

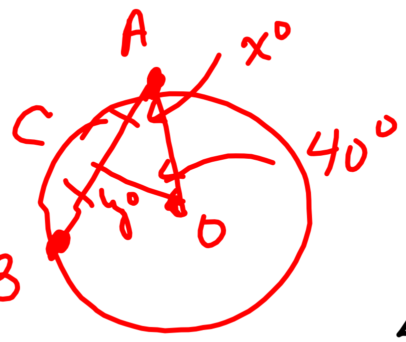
$\sqrt{a^2} = \sqrt{19\,202.25}$

$a \doteq 138.5722$

$a \doteq 139$ Km

WARM-UP QUESTIONS:
PAGE 389, #12 ; PAGE 397, #4a

4\. a)



$\angle y = 90°$ (PCP)

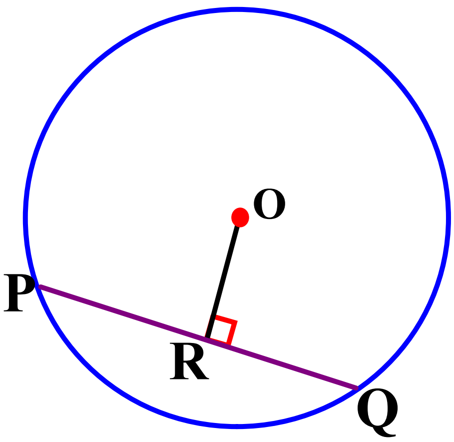
$\angle ACO = 90°$ (PCP)

$\angle AOC = 40°$ (GIVEN)

$\angle x = 50°$ (SATT)

VOCABULARY:

3. **PERPENDICULAR TO CHORD PROPERTY 1 (PCP):** The perpendicular from the centre of a circle to a chord bisects the chord.



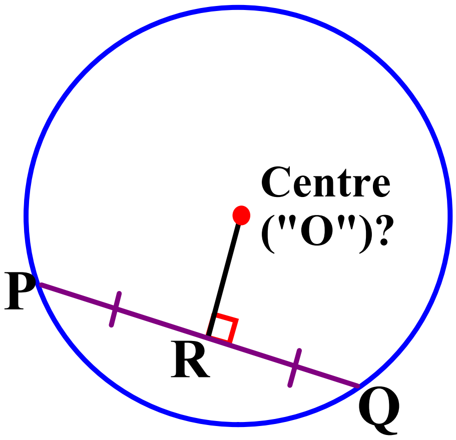
O = centre of the circle (given)

<R = <R = 90^{o} (given)

∴ PR = QR (PCP)

VOCABULARY:

4. PERPENDICULAR TO CHORD PROPERTY 2 (PCP): The perpendicular bisector of a chord in a circle passes through the centre of the circle.



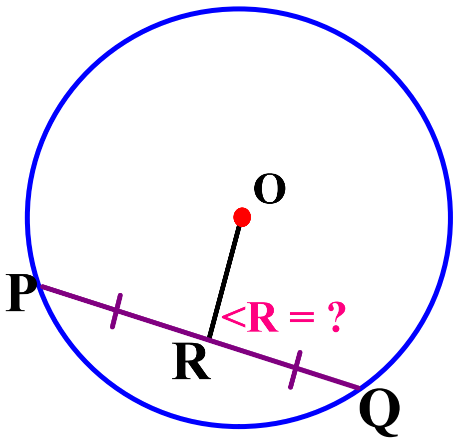
PR = QR (given)

<R = <R = 90^{o} (given)

∴ O = centre of the circle (PCP)

VOCABULARY:

5. **PERPENDICULAR TO CHORD PROPERTY 3 (PCP): A line that joins the centre of a circle to the midpoint of a chord is perpendicular to the chord.**



PR = QR (given)

O = centre of the circle (given)

∴ <R = <R = 90^{o} (PCP)

STOP!

YES!!!

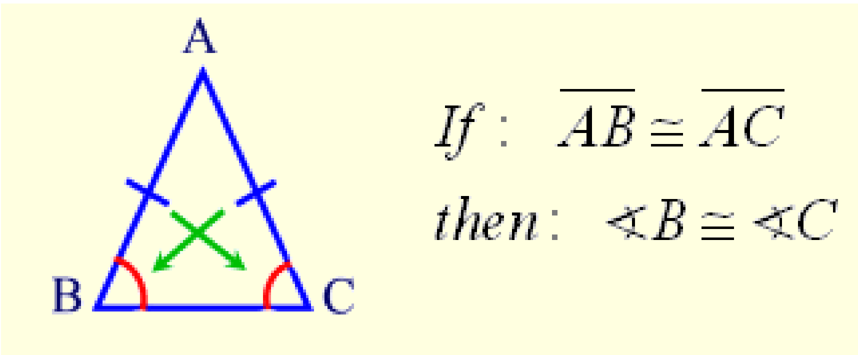
There are 3 pieces to the Perpendicular to Chord Property puzzle:

The perpendicular bisector of a chord in a circle passes through the centre of the circle, intersects with the chord at a 90° angle and cuts the chord into two equal pieces.

As long as you have 2 of the pieces of the puzzle, you automatically know the third.

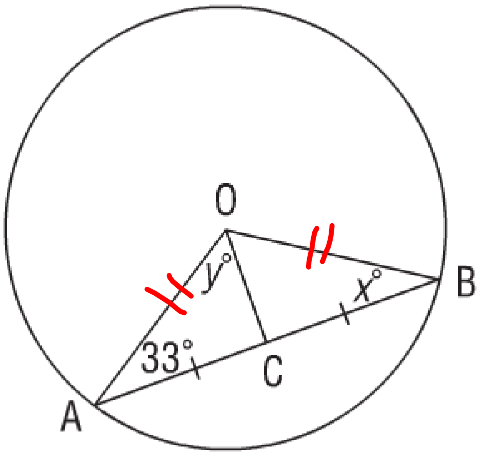
VOCABULARY:

6. **ISOSCELES TRIANGLE THEOREM (ITT) :** **The two angles that are opposite to the two congruent sides in an isosceles triangle are also congruent.**



Determining the Measure of Angles in a Triangle

Example: **Determine the values of x° and y° in the diagram below.**

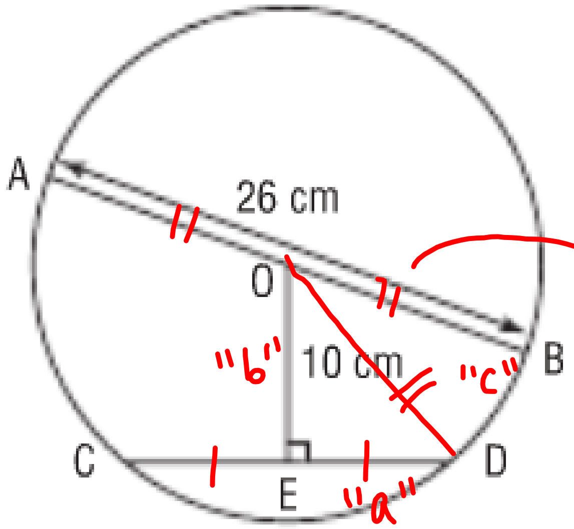


<x = 33° (ITT)

<A = 33° (given)
<C = 90° (PCP)
<y = 57° (SATT)

Using the Pythagorean Theorem in a Circle

Example: What is the length of chord CD to the nearest tenth?



CE = DE (PCP)

BO = 13cm (radius)

ANSWER:

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

$a^2 + 10^2 = 13^2$

$a^2 + 100 = 169$

$\sqrt{a^2} = \sqrt{69}$

$a \doteq 8.3066 \text{ cm (DE)}$

$CD = 2(DE)$

$\doteq 2(8.3066)$

$\doteq 16.6132$

$\doteq 16.6 \text{ cm}$

CONCEPT REINFORCEMENT:

MMS9:

PAGE 397: #3, #4bc, #5 & #6