

MAY 15, 2017

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?

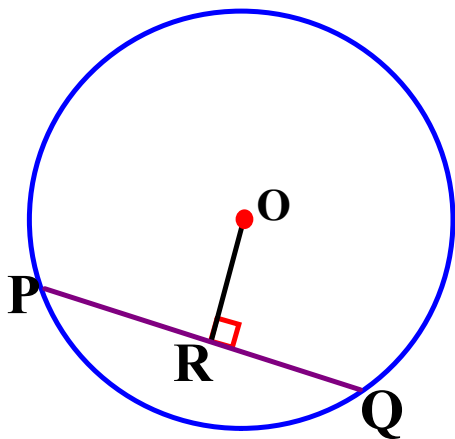
We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Shape and Space 1" OR "SS1" which states:

"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."**

VOCABULARY:

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



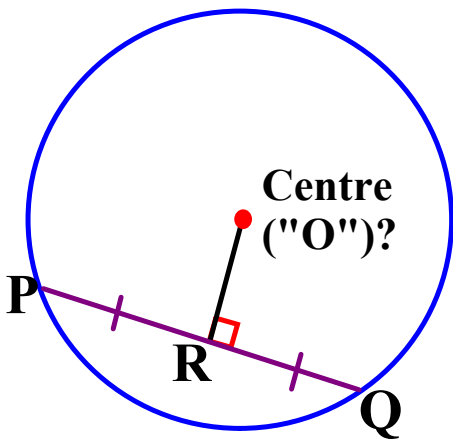
O = centre of the circle (given)

$\angle R = \angle R = 90^\circ$ (given)

$\therefore PR = QR$ (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.



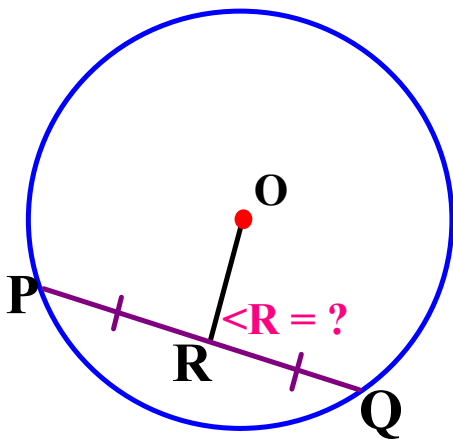
$$PR = QR \text{ (given)}$$

$$\angle R = \angle R = 90^\circ \text{ (given)}$$

•• 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.



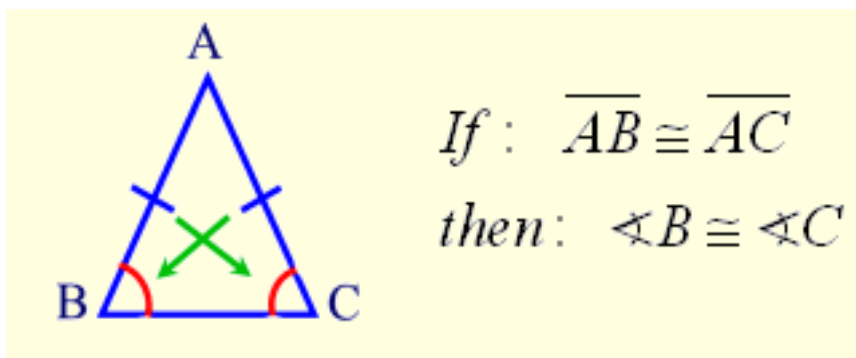
$PR = QR$ (given)

O = centre of the circle (given)

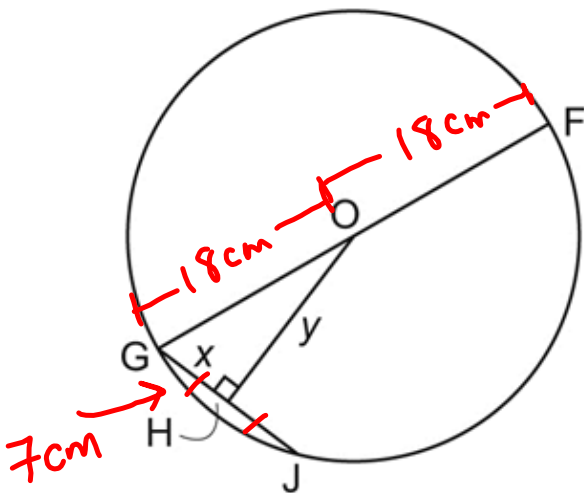
$\therefore \angle R = \angle R = 90^\circ$ (PCP)

VOCABULARY:

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



WARM-UP: Point O is the centre of the circle. $OF = 18 \text{ cm}$ and $GJ = 14 \text{ cm}$. Determine the values of x and y to the nearest tenth of a centimetre, where necessary.



$$GH = HJ = 7 \text{ cm (PCP)}$$

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

$$y^2 + 7^2 = 18^2$$

$$y^2 + 49 = 324$$

$$\sqrt{y^2} = \sqrt{275}$$

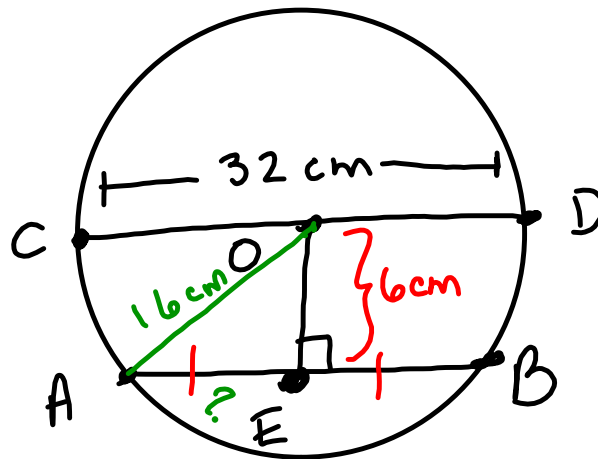
$$y = 16.6 \text{ cm}$$

ANSWERS: x (GH) = 7 cm (PCP)

y (HO) = 16.6 cm

WARM-UP: A circle has a diameter of 32 cm. Chord AB is 6 cm from point O, the centre of the circle.

- Sketch a diagram.
- What is the length of chord AB to the nearest tenth of a centimetre?



$$AE = BE \text{ (PCP)}$$

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

$$a^2 + 6^2 = 16^2$$

$$a^2 + 36 = 256$$

$$\sqrt{a^2} = \sqrt{220}$$

$$a \doteq 14.8324 \text{ cm (AE)}$$

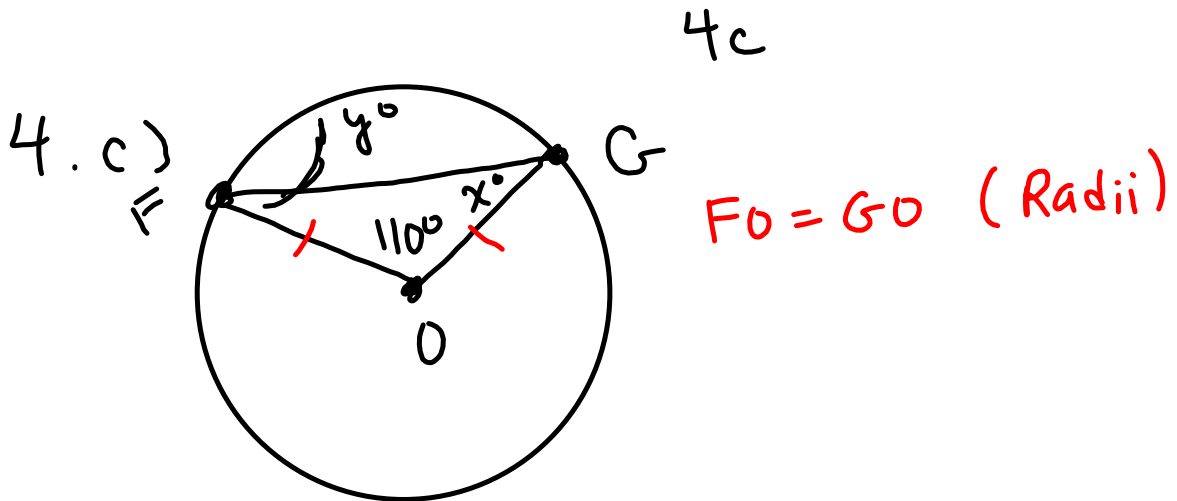
$$AB = 2(AE)$$

$$\doteq 2(14.8324)$$

$$\doteq 29.6648$$

$$\doteq 29.7 \text{ cm}$$

HOMEWORK QUESTIONS?
(page 397, #3 TO #6)



$\angle GFO = \angle FGO = 35^\circ$ (\perp TT / SATT)

CONCEPT REINFORCEMENT:

MMS9:

PAGE 398: #7, #10 [(a) $s = 3.5$ or 3.8],
#11 & #12

*****HOMEWORK CHECK TUESDAY!!!*****

*****PCP QUIZ TUESDAY!!!*****