

MAY 16, 2017

UNIT 8: CIRCLE GEOMETRY

**8.3: PROPERTIES OF
ANGLES IN A
CIRCLE**

M. MALTBY INGERSOLL
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: A circle has a diameter of 26 cm. Chord AB is 5 cm from point O, the centre of the circle.

a) Sketch a diagram.

b) What is the length of chord AB?

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

ANSWER: 24 cm

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

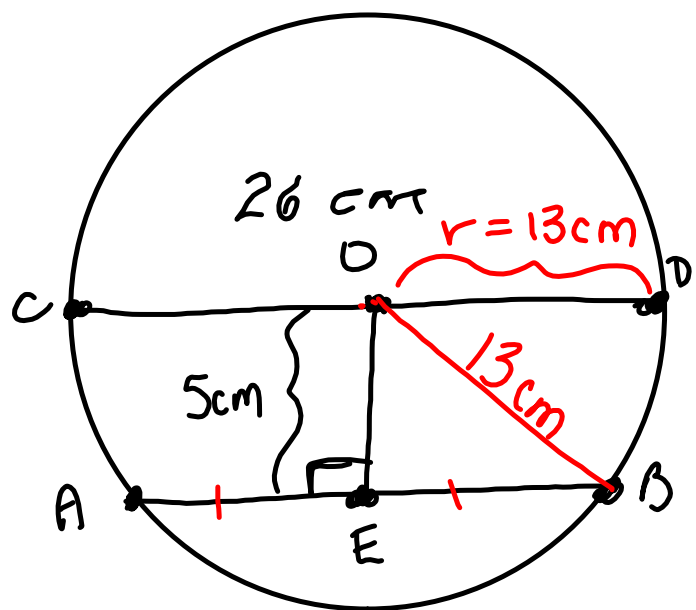
$$a^2 + 5^2 = 13^2$$

$$a^2 + 25 = 169$$

$$\sqrt{a^2} = \sqrt{144}$$

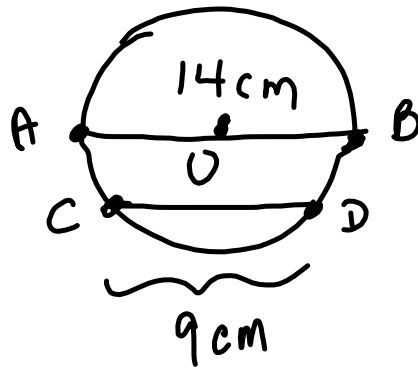
$$a = 12 \text{ cm (BE)}$$

$$\begin{aligned} AB &= 2(BE) \\ &= 2(12) \\ &= 24 \text{ cm} \end{aligned}$$



HOMEWORK QUESTIONS?
(page 398, #7, #10, #11 and #12)

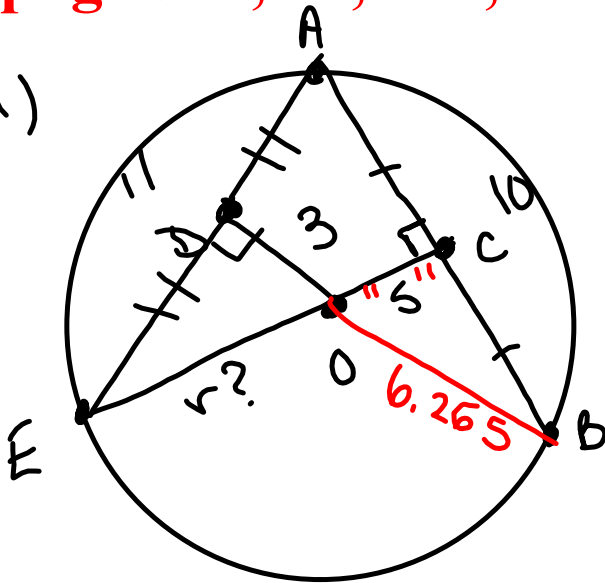
12. a) (ii)



The chord is shorter than the diameter, so it can definitely fit in this circle.

HOMWORK QUESTIONS?
(page 398, #7, #10, #11 and #12)

10. a)



$$AC = BC = 10 \text{ (PCP)}$$

$$AD = DE = 5.5 \text{ (PCP)}$$

EO? (radius)

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

$$3^2 + 5.5^2 = r^2$$

$$9 + 30.25 = r^2$$

$$\sqrt{39.25} = \sqrt{r^2}$$

$$6.265 = r$$

CO ("5"):

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

$$5^2 + 5^2 = 6.265^2$$

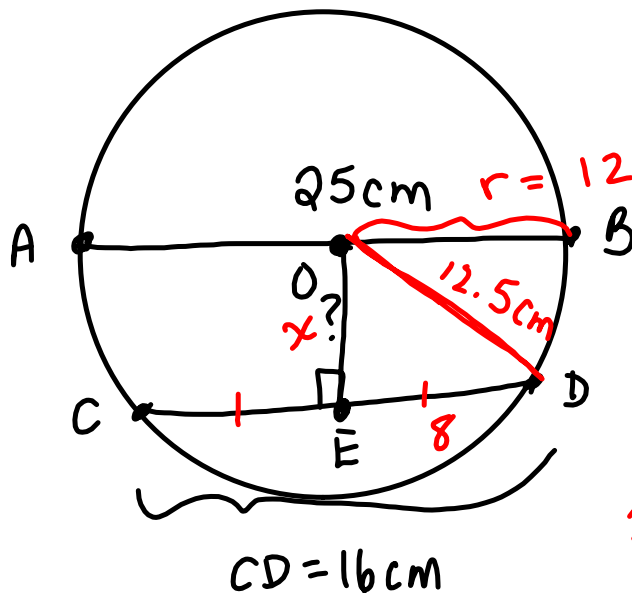
$$5^2 + 25 = 39.2502$$

$$\sqrt{5^2} = \sqrt{14.2502}$$

$$5 \doteq 3.8$$

HOMEWORK QUESTIONS?
(page 398, #7, #10, #11 and #12)

11.



$$CE = DE = 8 \text{ cm (PCP)}$$

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

$$x^2 + 8^2 = 12.5^2$$

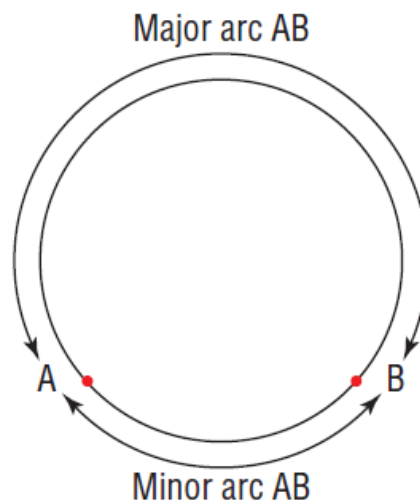
$$x^2 + 64 = 156.25$$

$$\sqrt{x^2} = \sqrt{92.25}$$

$$x = 9.6 \text{ cm}$$

VOCABULARY:

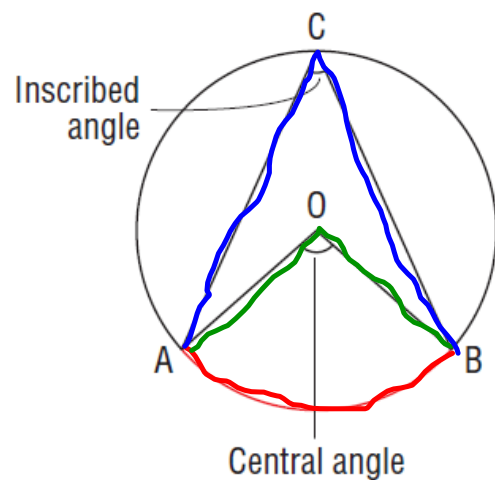
- ARC:** A section of the circumference of a circle. In the diagram below, the **shorter arc AB** is the **MINOR ARC**, and the **longer arc AB** is the **MAJOR ARC**.



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.)

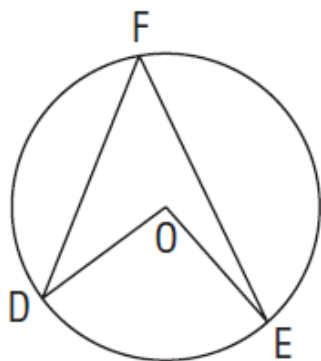
3. **INSCRIBED ANGLE:** The angle formed by joining the endpoints of an arc to a point on the circle.



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

VOCABULARY:

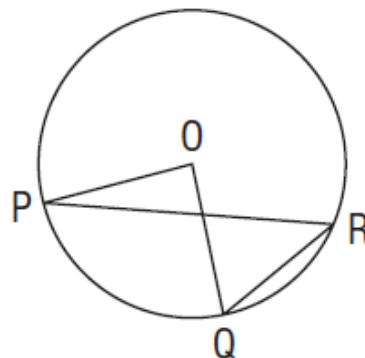
- 4. CENTRAL ANGLE AND INSCRIBED ANGLE PROPERTY (CIAP):** In a circle, the measure of a central angle subtended by an arc is **TWICE** the measure of an inscribed angle subtended by the **SAME** arc.



$$\angle O = 2\angle F$$

OR

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



$$\angle O = 2\angle R$$

OR

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

Attachments

Worksheet - Angles in a Circle.doc