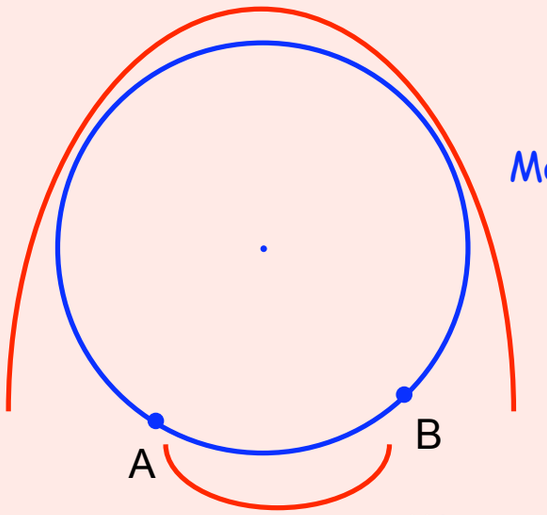
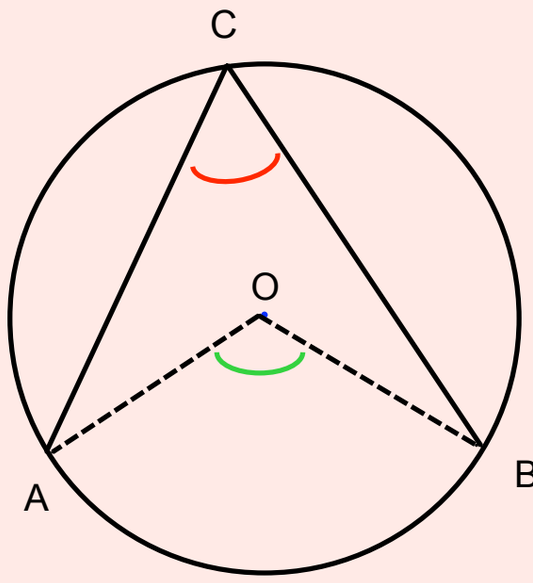
Section 8.3 - Properties of Angles in a Circle



Major Arc AB - longer arc

Minor Arc AB - shorter arc

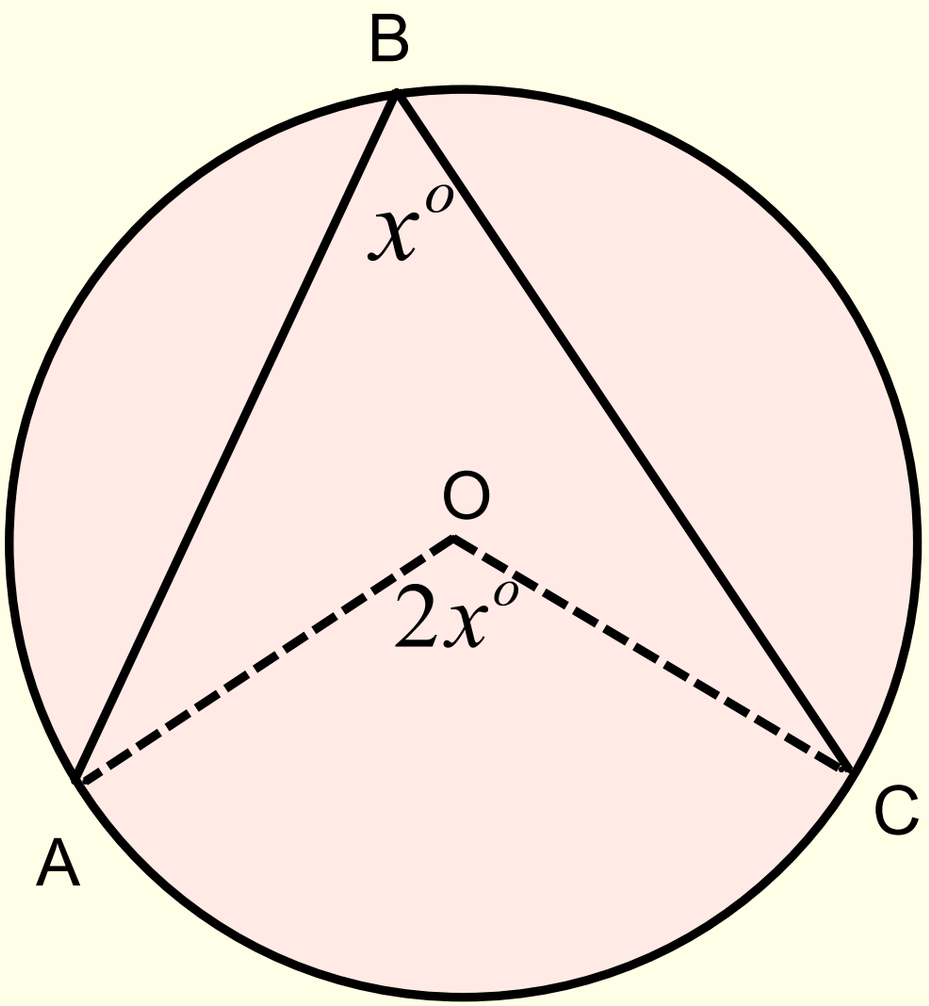


Inscribed Angle - join points of an arc to a point on the circle

Central Angle - join endpoints of an arc to the center of the circle

Both angles are subtended by the minor arc AB

Central Angle and Inscribed Angle Property

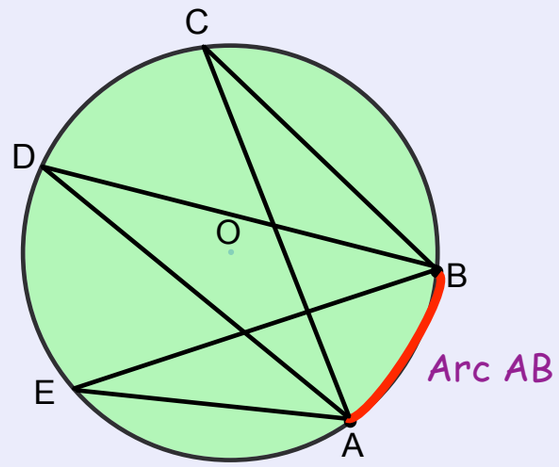


The measure of the central angle $\angle AOC$ is twice the measure of the inscribed angle $\angle ABC$

If $\angle ABC = 63^o$, $\angle AOC = ?$

Inscribed Angle Property

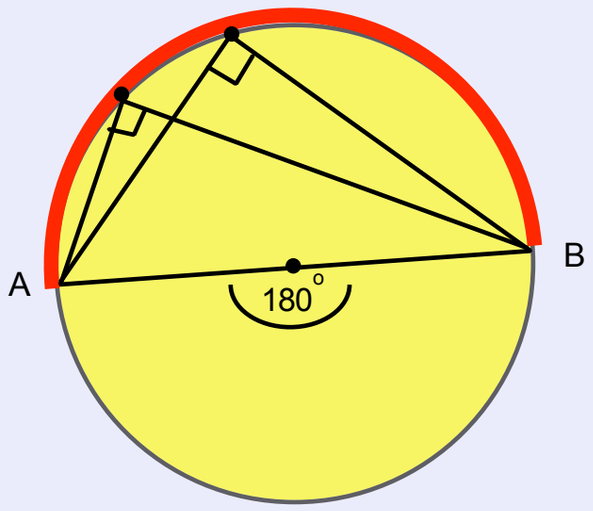
Inscribed angles subtended by the same arc are equal



<C = <D = <E

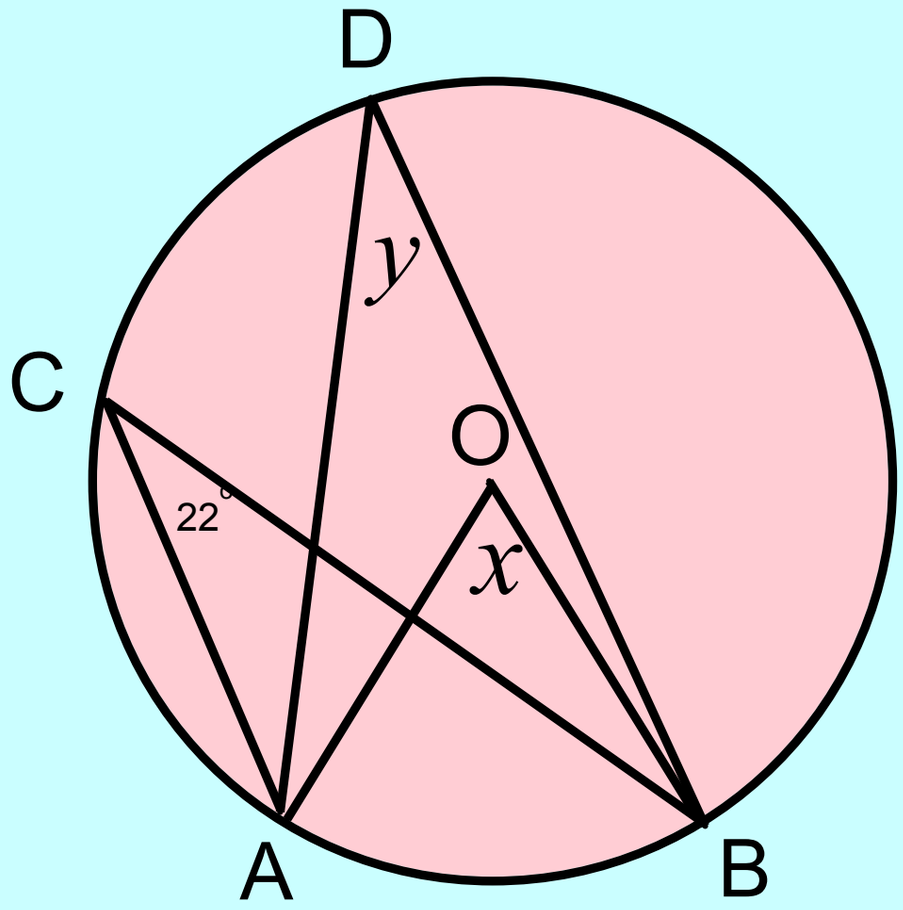
or

<ACB = <ADB = <AEB



All incribed angles subtended by a semicircle are right angles and = 90°

Example 1 Find x and y

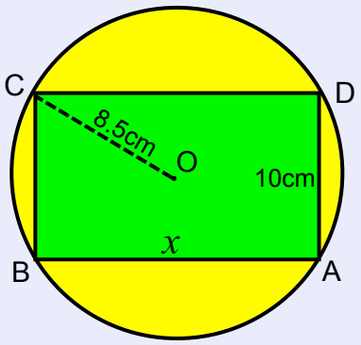


$< y = 22^o$

$< x = 44^o$

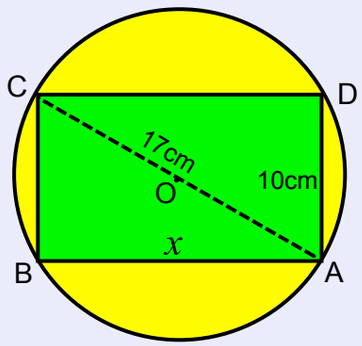
why?

Example 2:



Rectangle ABCD, the width is 10cm, find the length (x)

Rectangle ABCD is inscribed in the circle



The radius of the circle is 8.5cm, so AC = 2 x 8.5cm = 17cm

Use the pythagorean theorem to find the length AB

$$c^2 - a^2 = b^2$$

$$17^2 - 10^2 = b^2$$

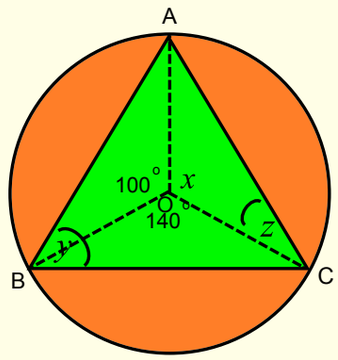
$$289 - 100 = b^2$$

$$189 = b^2$$

$$\sqrt{189} = b$$

$$13.748cm = b = AB$$

Example 3: Triangle is inscribed in a circle.
Determine values for x, y & z.



To find x...

Note: the sum of the central angles in a circle is 360^o

$\therefore$

$$100^o + 140^o + x^o = 360^o$$
$$240^o + x^o = 360^o$$
$$x^o = 360^o - 240^o$$
$$x^o = 120^o$$

To find y...

Note: <ABC is an inscribed angle and <AOC is a central angle, subtended by the sam arc.

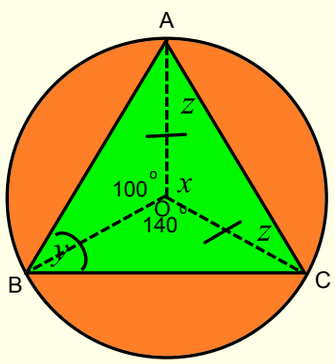
$\therefore$

$$< ABC = \frac{1}{2} < AOC$$
$$y^o = \frac{1}{2} \times 120^o$$
$$y^o = 60^o$$

To find z...

Note: OA and OC are radii, so $\triangle$ OAC is isosceles, so <OAC = <OCA = z^o. The sum of the angles in a triangle is 180^o

$\therefore$



$$120^o + z^o + z^o = 180^o$$
$$120 + 2z = 180$$
$$2z = 180 - 120$$
$$2z = 60$$
$$z = \frac{60}{2}$$
$$z = 30^o$$

Textbook: Page 410 - 412, #'s 3 - 12
Extra Practice #3
Review: Page 418 - 420