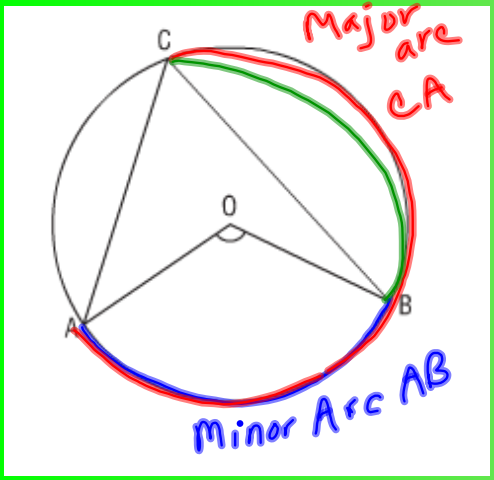
Section 8.3

Properties of Angles in a Circle



1) Name 2 chords

CB , CA

2) Name 2 angles

∠AOB ∠OAB

↑ central angle

∠ACB

∠CBO

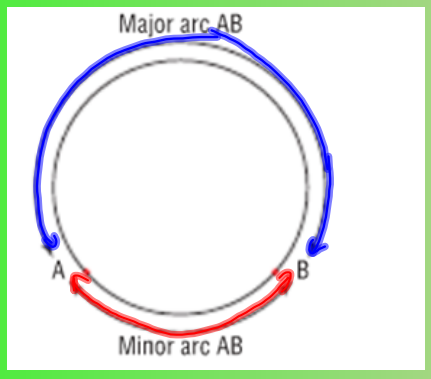
3) Name 2 radii

AO OB

4) Name 2 arcs

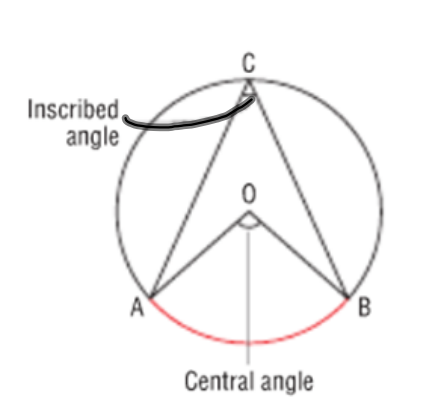
Terms/Properties to know:

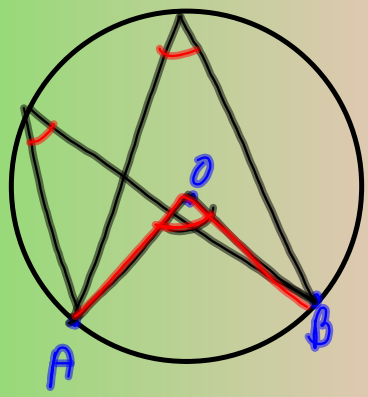
Arc- a section of the circumference of a circle is an arc.



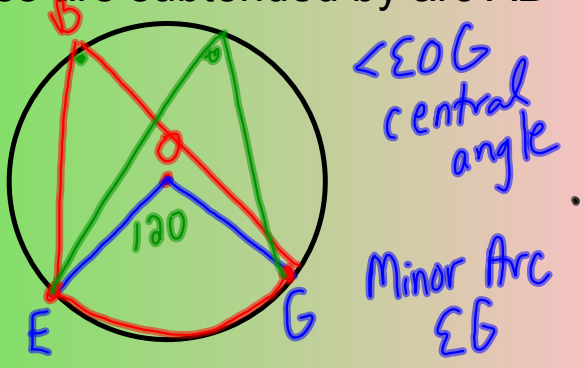
Central Angle-- the angle formed by joining the endpoints of an arc to the center of the circle

Inscribed Angle--The angle formed by joining the endpoints of an arc to a point on the circle



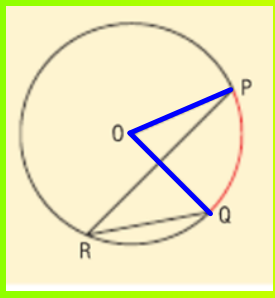


The inscribed and central angles are subtended by arc AB



Central Angle and Inscribed Angle Property

In a circle, the measure of a central angle subtended by an arc is twice the measure of the inscribed angle subtended by the same arc.



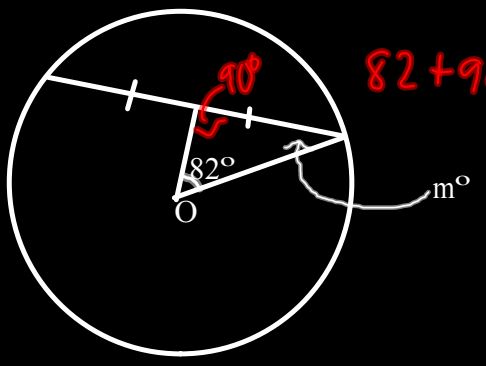
<POQ = 2 times <PRQ

THIS IS TRUE FOR ANY INSCRIBED ANGLE

[The inscribed angle is half the size of the central angle]

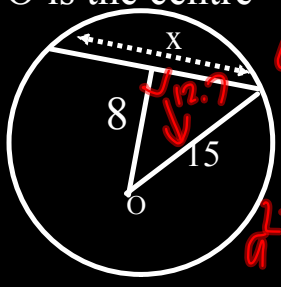
Warm-up

Determine the value of m, when O is the centre



$82+90+\_\_=180$

Determine the value of x, when O is the centre



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

$=15^2-8^2$

$a^2=225-64$

$a^2=161$

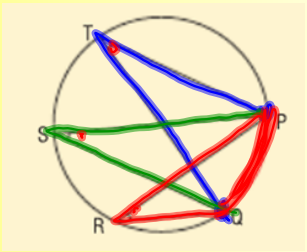
$a=12.7$

$x=25.4$

Inscribed Angles Property

In a circle, all of the inscribed angles subtended by the same arc are congruent [equal]

<PTQ = <PSQ = <PRQ



The two arcs formed by the endpoints of a diameter are semicircles.

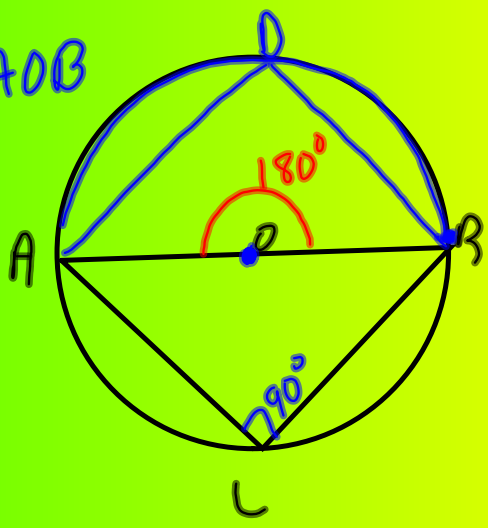
The central angle is a straight angle which is 180

The inscribed angle subtended by semicircle is one-half 180

Name central angle $\angle AOB$

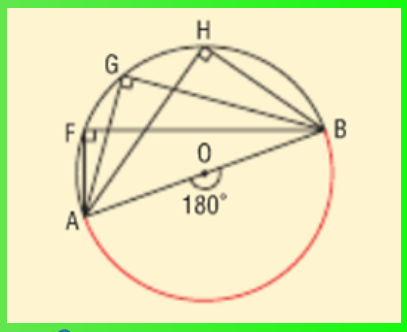
Name inscribed angle $\angle ACB$

Name the Arc $\overset{\frown}{AB}$



Angles in a Semicircle Property

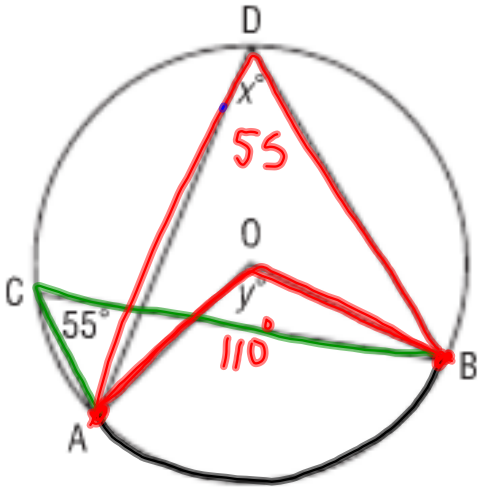
All inscribed angles subtended by a semicircle are right angles.



Since $\angle AOB = 180^\circ$

then $\angle AFB = \angle AGB = \angle AHB = 90^\circ$

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

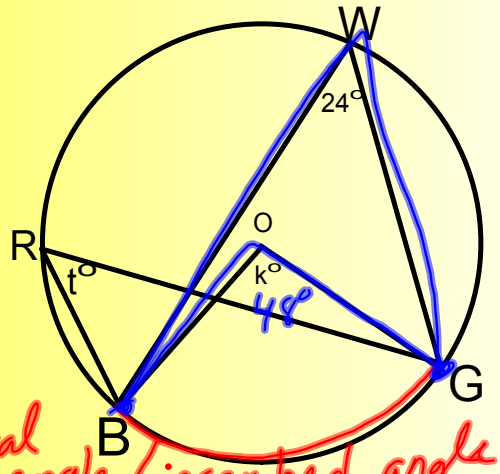


Give the circle properties used.

$y^\circ = \angle AOB$
$= 110^\circ$ [central angle/inscribed angle property]

$x^\circ = \angle ADB$
$= 55^\circ$
inscribed angle property
central angle/inscribed property

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

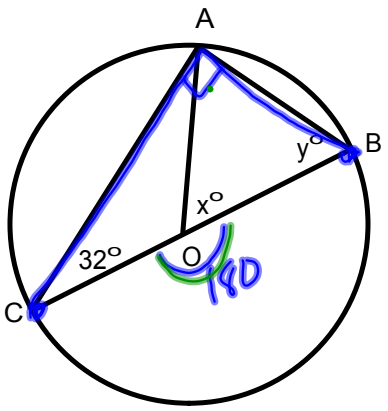


What circle properties were used.

$\angle BOG = 48^0$ [central angle / inscribed angle property]

$\angle BRG = 24^0$ because $\angle BWG$ and $\angle BRG$ are subtended from the same arc, therefore they are congruent.

$\angle BWG = 24^0$



Point O is the center of the circle.
Determine the value of x^o and y^o.

central angle

$\angle AOB$

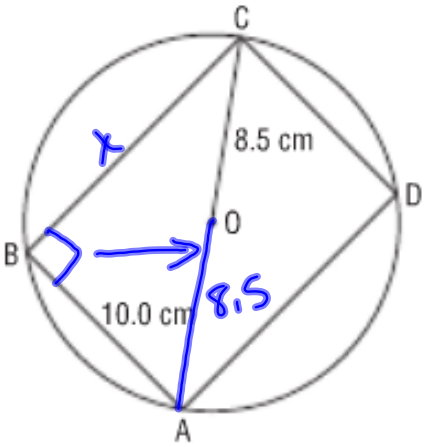
$x^\circ = 64^\circ$

$\angle ABO$

$\angle ABC$

$32 + 90 + 58 = 180$

Rectangle ABCD has its vertices on a circle with radius 8.5 cm.
The width of the rectangle is 10.0 cm. What is its length?
Give the answer to the nearest tenth.



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

13.7