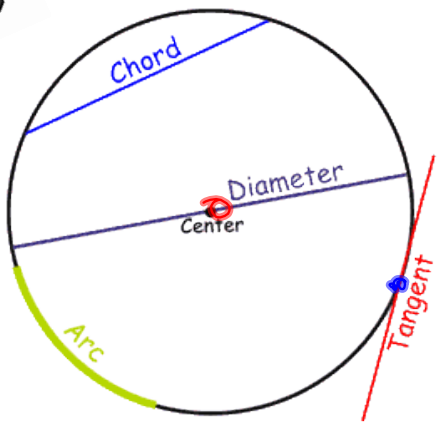
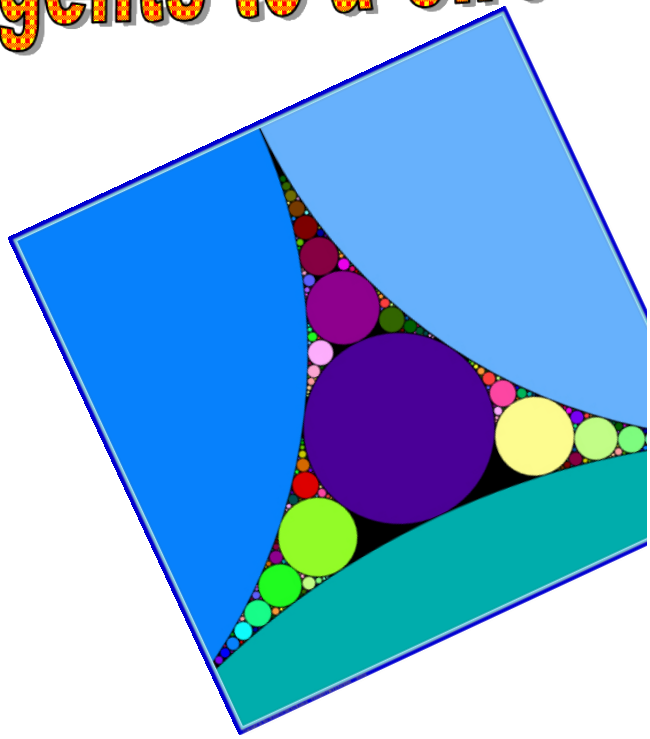
Section 8.1

Properties of Tangents to a Circle

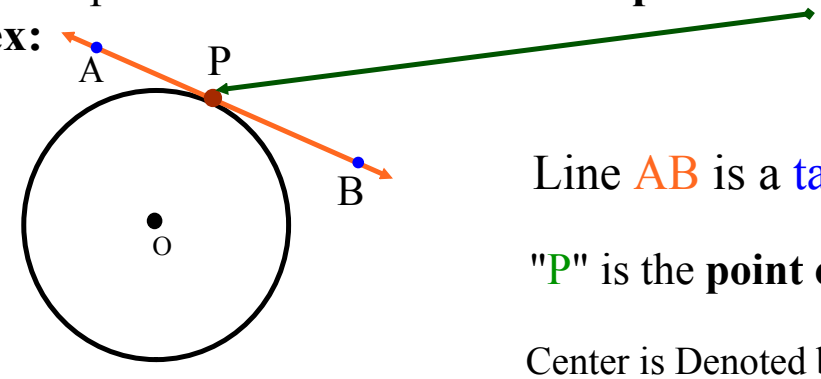




Tangent Properties

- **tangent -** a line that touches a circle/curve at only 1 point.
  - the point of contact is called the **point of tangency.**

ex:



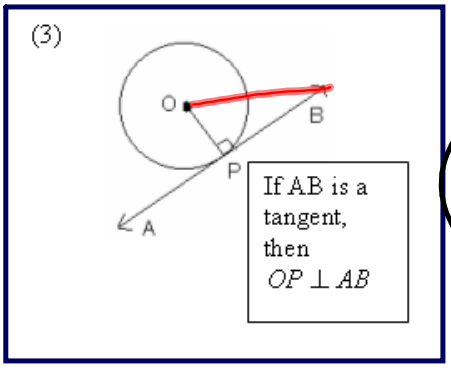
Line AB is a tangent

"P" is the **point of tangency**

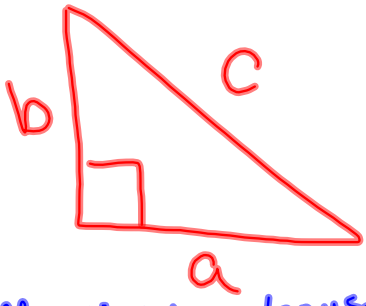
Center is Denoted by "O"

Tangent Property:

A tangent to a circle is perpendicular to the radius at the point of tangency. <APO = <BPO = 90°



"Join O to B and you have formed a right triangle. Thus, you can use the Pythagorean Theorem to find side lengths." (OR Angle sum of triangle to find missing angles)



Missing hypotenus

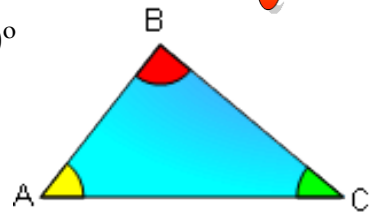
$a^2 + b^2 = c^2$

Missing Side

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

Determining the Measure of an Angle in a Triangle

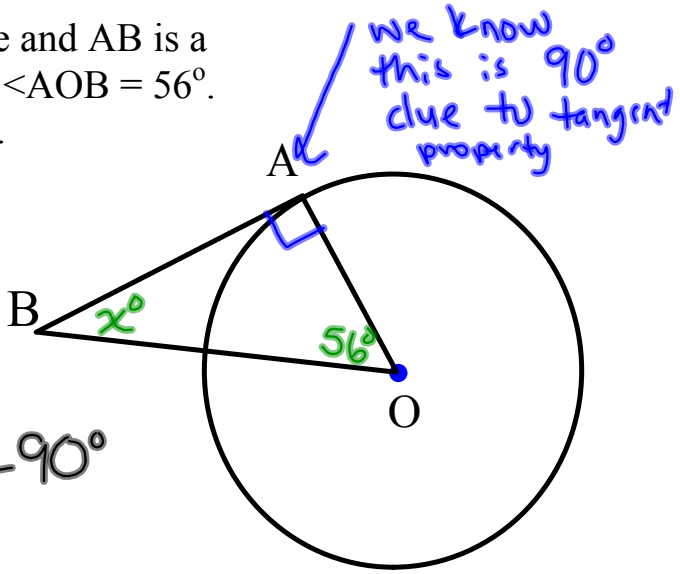
Remember: Angles in a triangle add up to 180°



$\angle A + \angle B + \angle C = 180°$

1) Point O is the centre of a circle and AB is a Tangent to the circle. In ΔOAB, <AOB = 56°. Determine the measure of <OBA.

(Show all Work)



$x° = 180° - 56° - 90°$

$x° = 34°$

Using the Pythagorean Theorem in a Circle

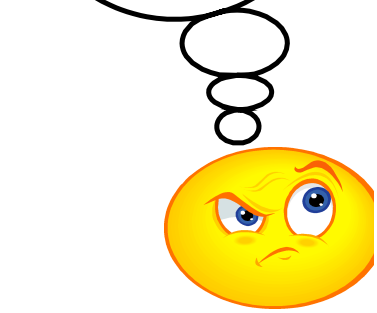
Remember:

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

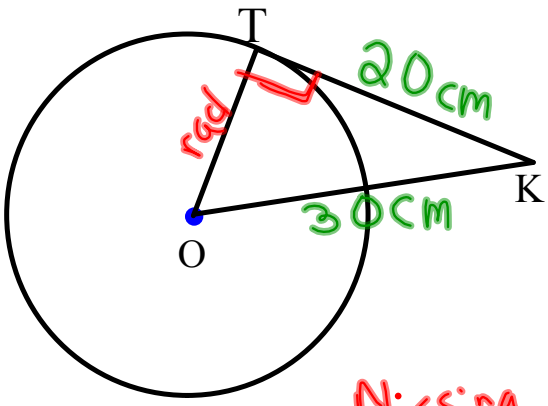
$c = \sqrt{a^2 + b^2}$

or

$a = \sqrt{c^2 - b^2}$



2) Point O is the center of a circle and TK is a tangent to the circle. TK is 20cm and OK = 30cm. Determine the length of the radius OT. Give the answer to the nearest tenth. (Show all Work)



Missing Side

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

$r^2 = 30^2 - 20^2$

$r^2 = 900 - 400$

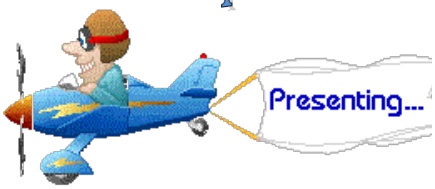
$r^2 = 500$

$r = \sqrt{500}$

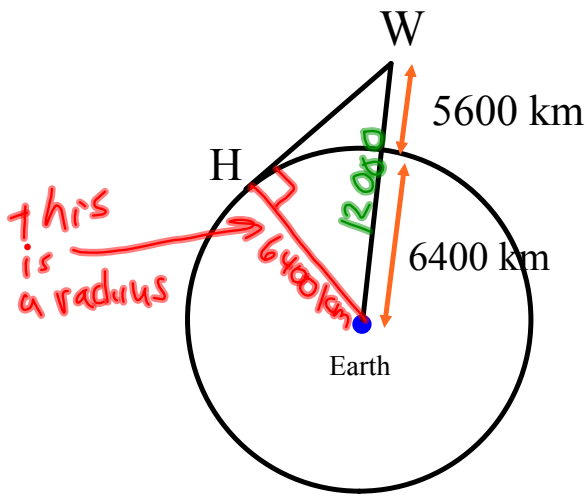
$r = 22.4\text{ cm}$

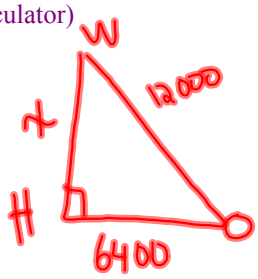
Answer: OT = 22.4 cm

Solving Problems Using the Tangent and Radius Property



An airplane, W, is cruising at an altitude of 5600 km. A cross section of Earth is a circle with radius approximately 6400 km. A passenger wonders how far she is from a point H on the horizon she sees outside the window. Calculate this distance to the nearest kilometre. (You NEED a calculator)





Missing Side

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

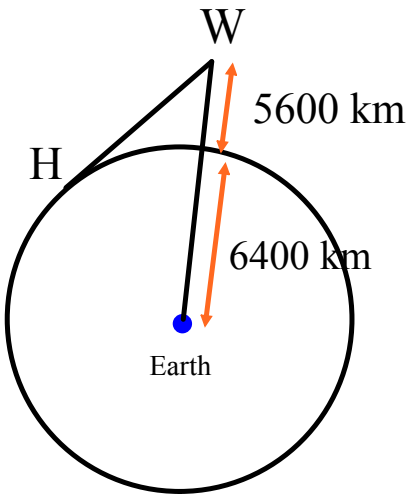
$x^2 = (12000)^2 - (6400)^2$

Solving Problems Using the Tangent and Radius Property

Solution

An airplane, W, is cruising at an altitude of 5600m. A cross section of Earth is a circle with radius approximately 6400 km. A passenger wonders how far she is from a point H on the horizon she sees outside the window. Calculate this distance to the nearest kilometre.

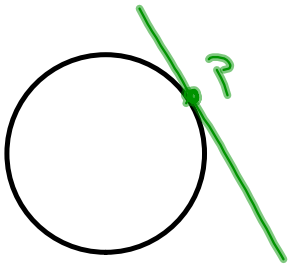
$c^2 = a^2 + b^2$ $\qquad$ $a^2 = c^2 - b^2$



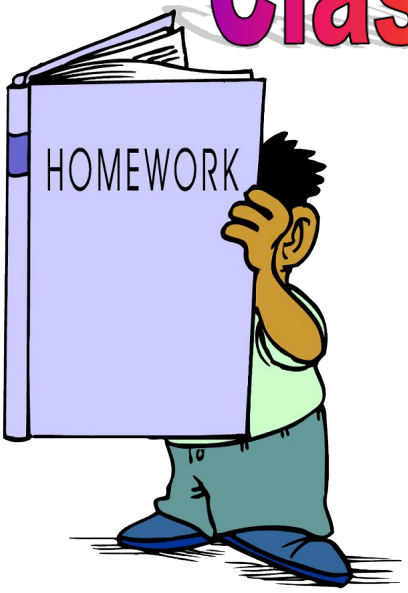
$a^2 = c^2 - b^2$
$= (12000)^2 - (6400)^2$
$= 144000000 - 40960000$
$= 103040000$

$a = \sqrt{103040000}$

$a = 10150.9$ km

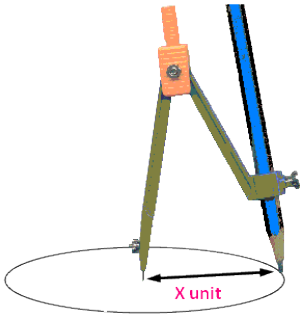

r

Class/Homework

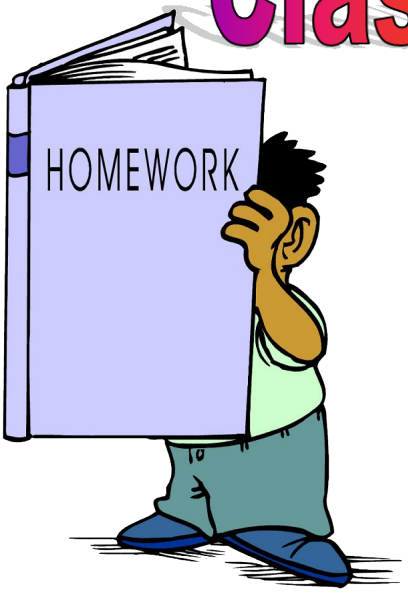


Page 388-390

Worksheet



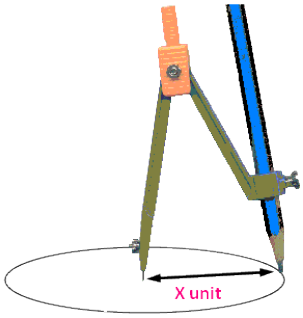
Class/Homework



Page 388-390

Day 1

3 ab
4a
5abc
6abc
7ab



Attachments

Section 8.1 Sticky Note Activity.docx