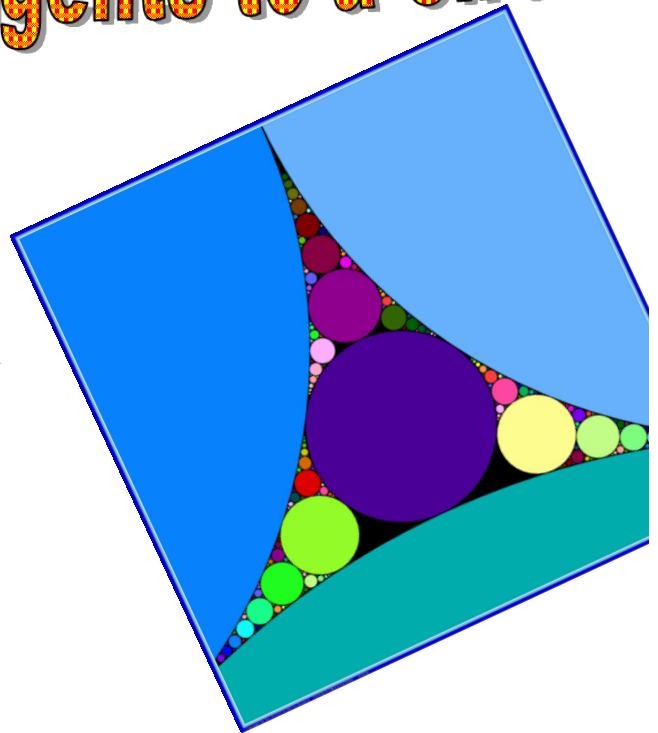
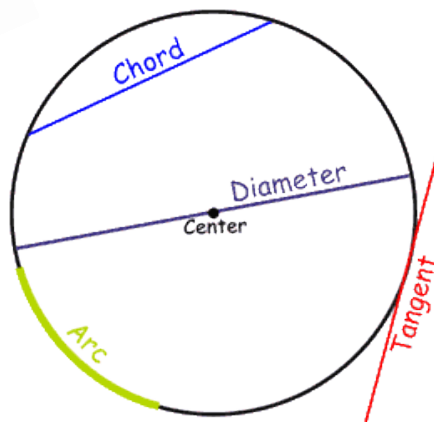


# Section 8.7

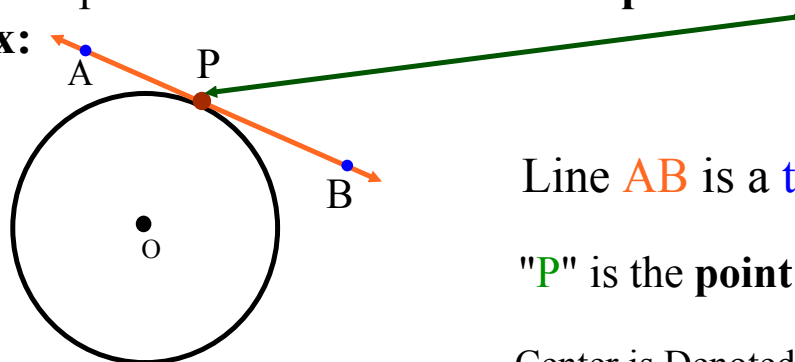
## Properties of Tangents to a Circle



## 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:



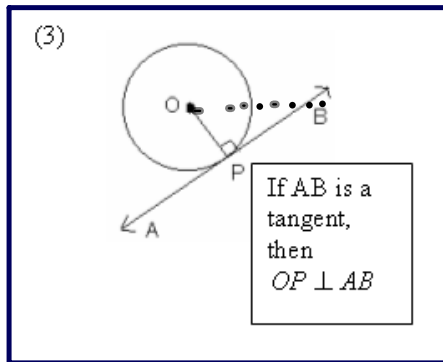
Line **AB** is a **tangent**

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

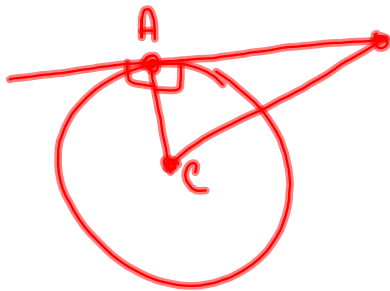
Center is Denoted by "**O**"

### Tangent Property:

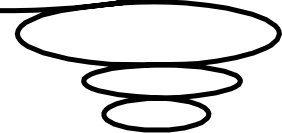
A tangent to a circle is perpendicular to the radius at the point of tangency.  $\angle APO = \angle BPO = 90^\circ$



"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)

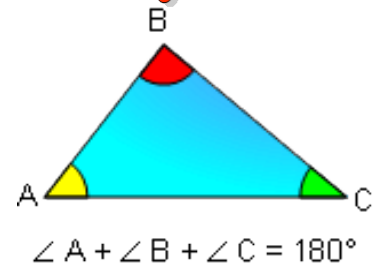


$$a^2 + b^2 = c^2$$



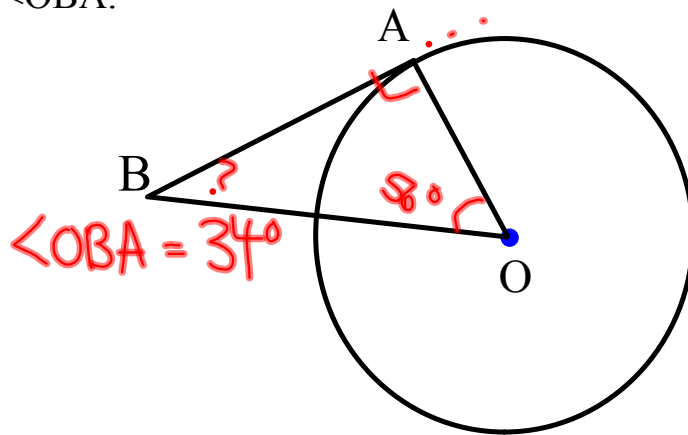
# Determining the Measure of an Angle in a Triangle

Remember: Angles in a triangle add up to  $180^\circ$



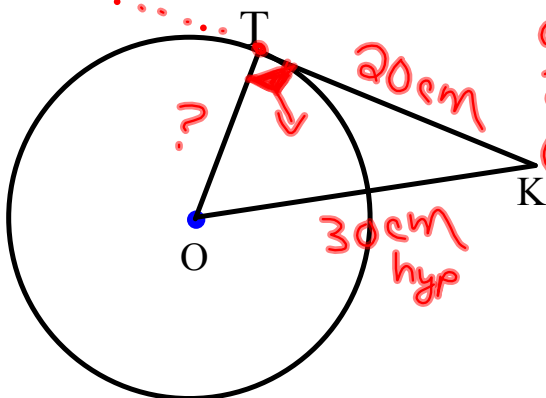
1) Point O is the centre of a circle and AB is a Tangent to the circle. In  $\triangle OAB$ ,  $\angle AOB = 56^\circ$ . Determine the measure of  $\angle OBA$ .

(Show all Work)



# Using the Pythagorean Theorem in a Circle

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)



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 a^2 + b^2 &= h^2 \\
 20^2 + b^2 &= 30^2 \\
 400 + b^2 &= 900 - 400 \\
 \sqrt{b^2} &= \sqrt{500} \\
 b &= 22.4
 \end{aligned}$$

Remember:

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

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

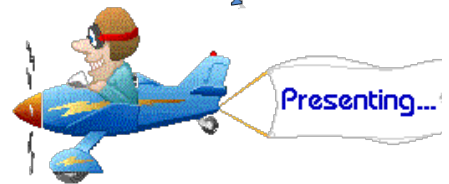
or

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

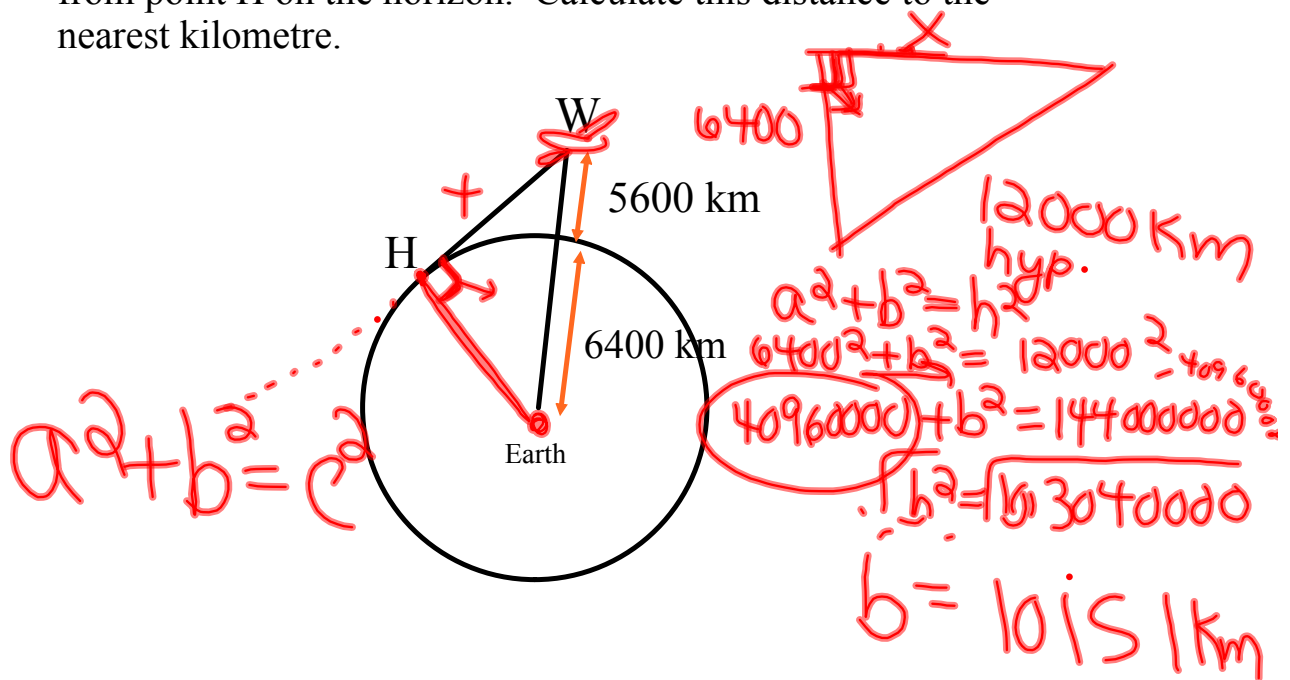


Answer:

# Solving Problems Using the Tangent and Radius Property

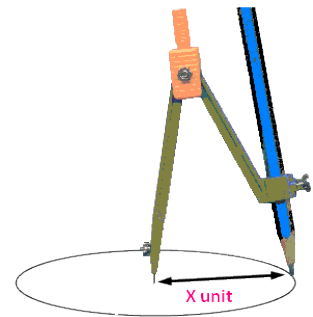
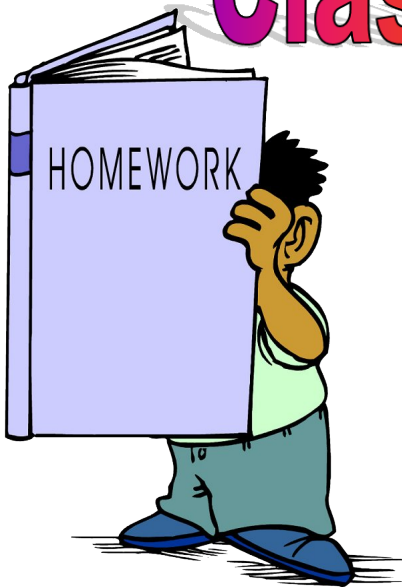


An airplane, W, is cruising at an altitude of 5600m. A cross section of Earth is a circle with radius approximately 6400 km. A passenger looks out her window and wonders how far she is from point H on the horizon. Calculate this distance to the nearest kilometre.



# Class/Homework

Page 388-390



Page 388 #5