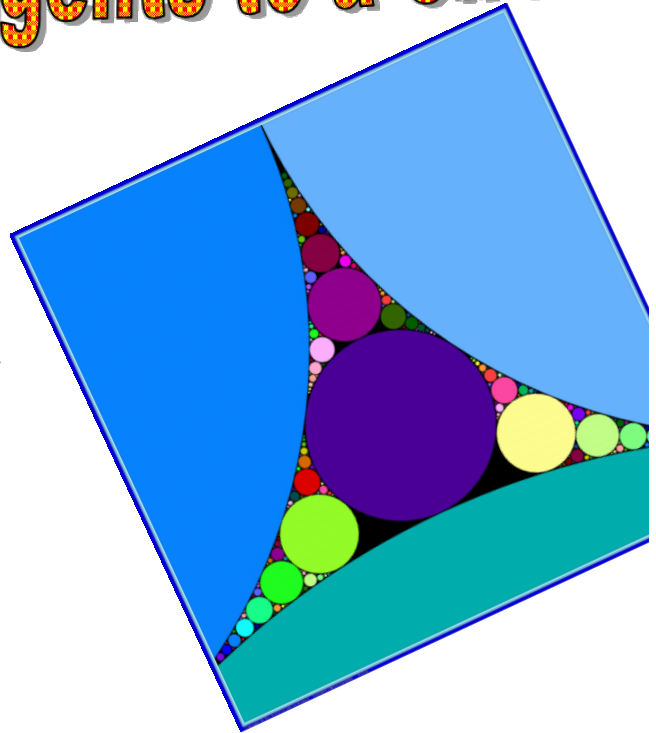
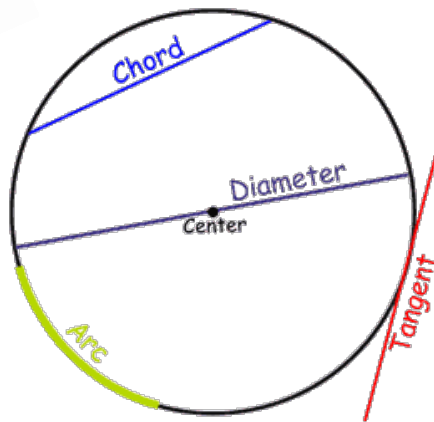


Section 8.7

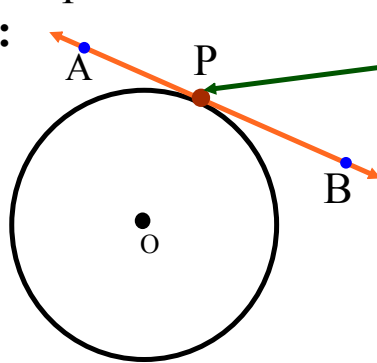
Properties of Tangents to a Circle



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:



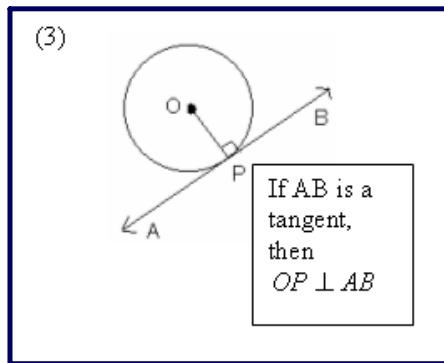
Line **AB** is a **tangent**

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

Center is Denoted by "**O**"

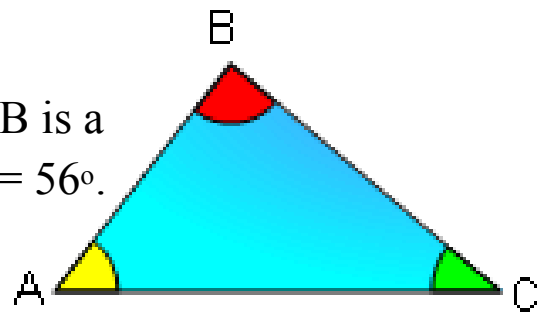
Tangent Property:

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



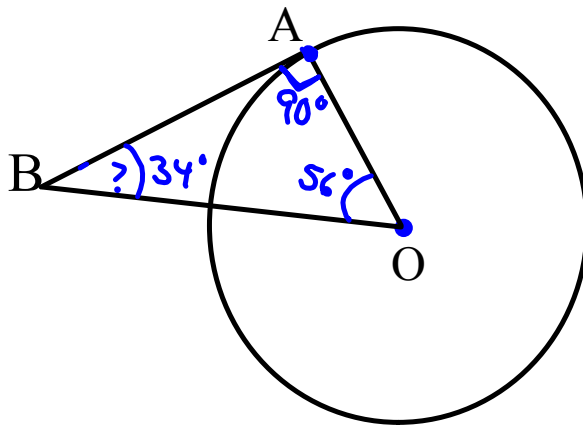
"Join O to B and you have formed a right triangle. Thus, you can use the Pythagorean Theorem to find side lengths." (OR Angle sum of triangle to find missing angles)

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 $\angle OBA$.



$$\angle A + \angle B + \angle C = 180^\circ$$

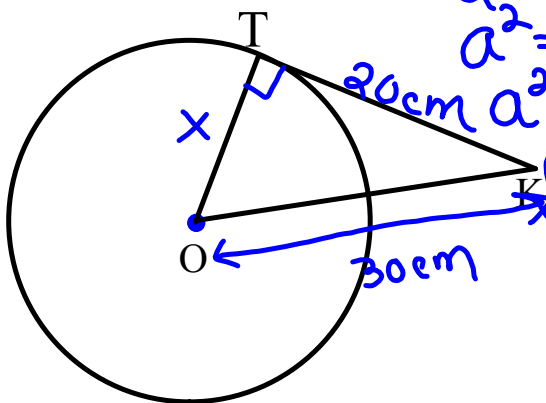
$$180^\circ - 146^\circ = 34^\circ$$



Using the Pythagorean Theorem in a Circle

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

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)



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

Remember:

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

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

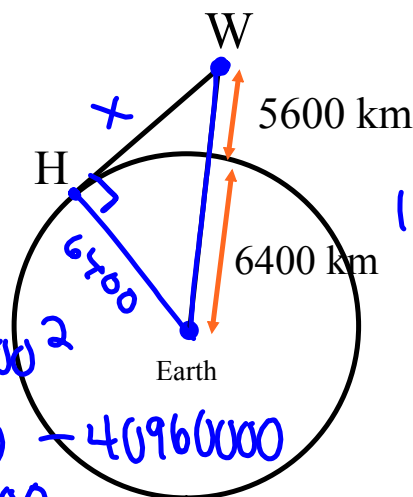
or

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



Answer:

An airplane, W, is cruising at an altitude of 5600km. 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.



12000 km

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

$$a^2 = 12000^2 - 6400^2$$

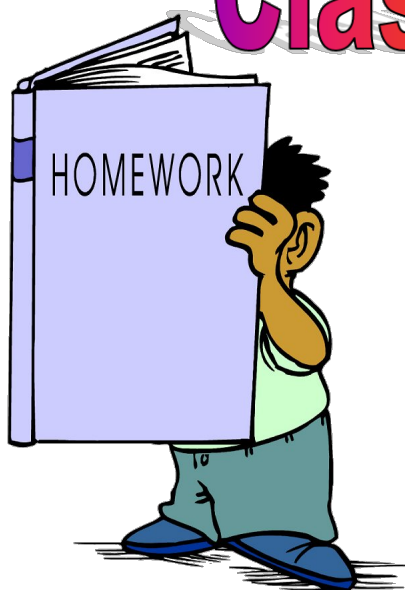
$$a^2 = 144000000 - 40960000$$

$$\sqrt{a^2} = \sqrt{103040000}$$

$$a = 10151 \text{ km}$$

Class/Homework

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