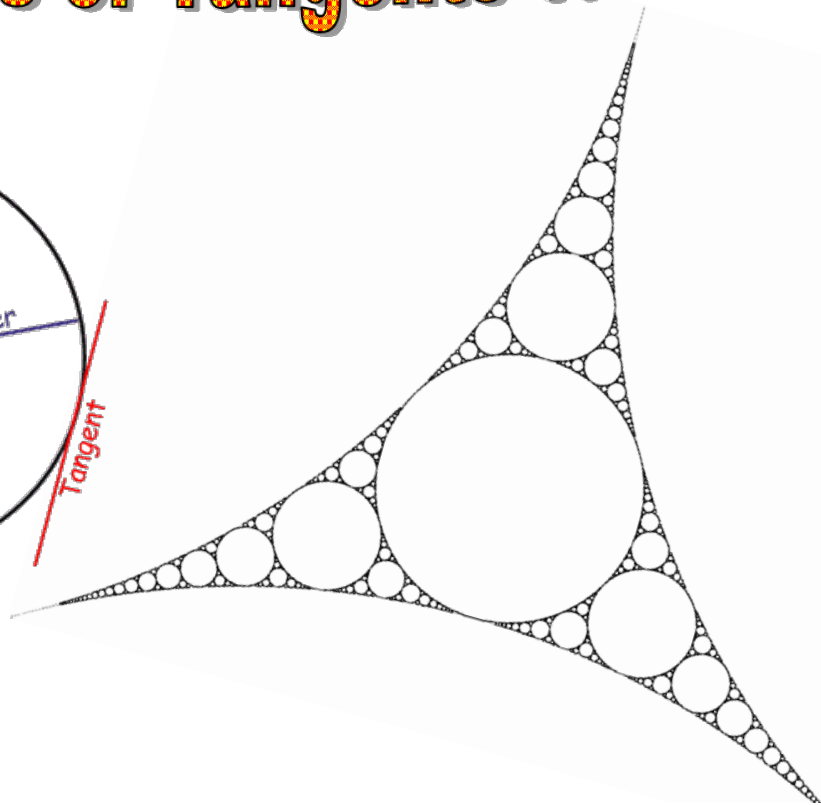
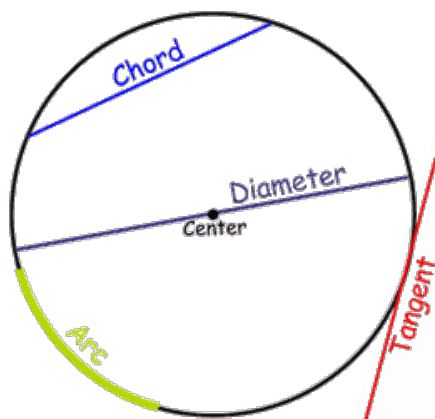


Section 8.7

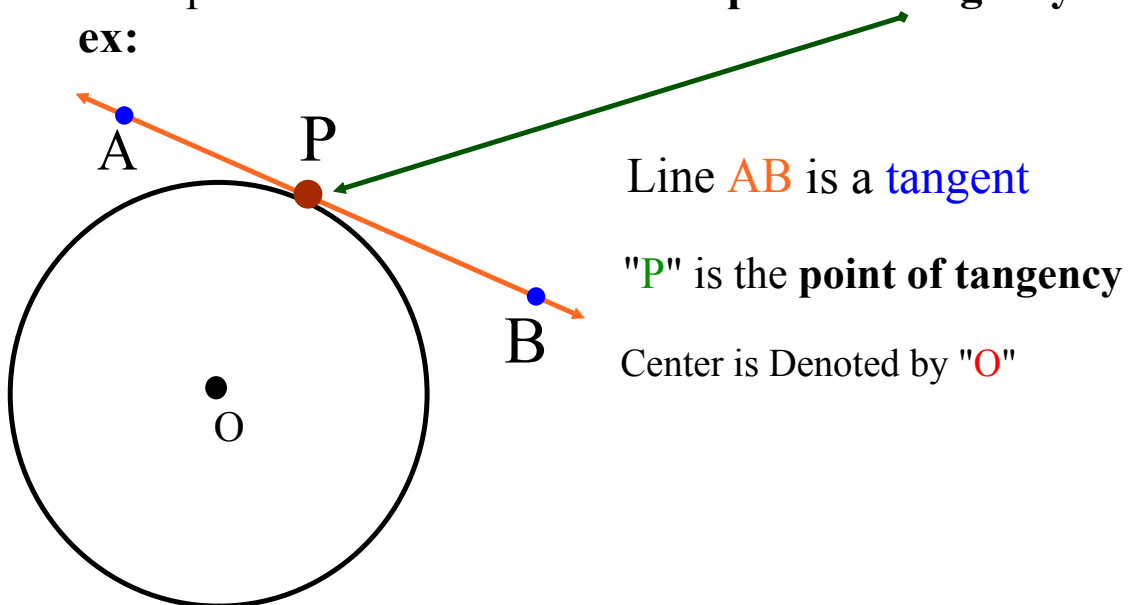
Properties of Tangents to a Circle



Tangent Properties

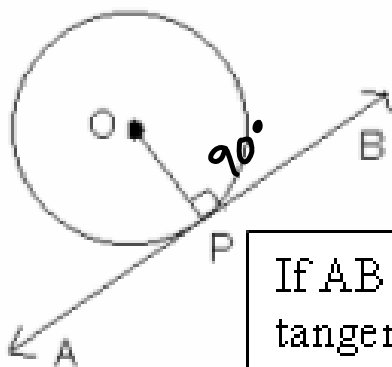
- **tangent** - a line that touches a circle/curve at only 1 point.
- the point of contact is called the **point of tangency**.

ex:



Tangent Property:

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

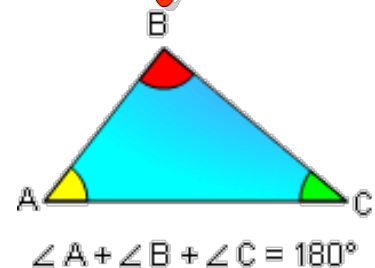


If AB is a tangent,
then
 $OP \perp AB$

"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)

Determining the Measure of an Angle in a Triangle

Remember: Angles in a triangle add up to 180°



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 $\angle OBA$.

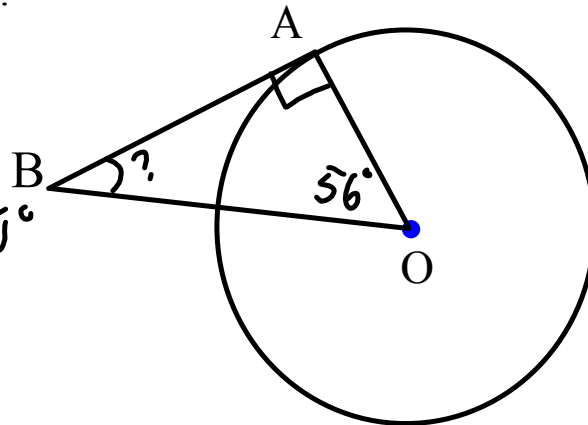
(Show all Work)

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

$$90^\circ + \angle B + 56^\circ = 180^\circ$$

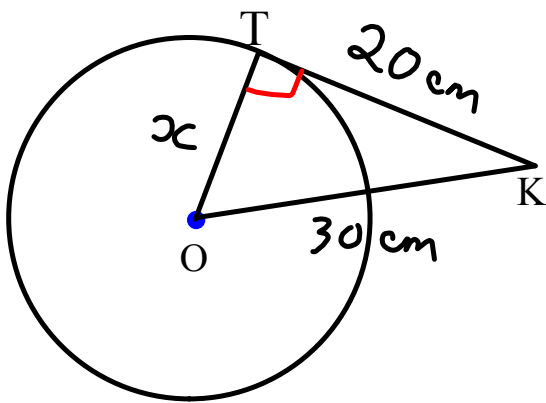
$$\angle B = 180 - 90 - 56$$

$$\boxed{\angle B = 34^\circ}$$



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)



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

$$30^2 = 20^2 + x^2$$

$$30^2 - 20^2 = x^2$$

$$900 - 400 = x^2$$

$$500 = x^2$$

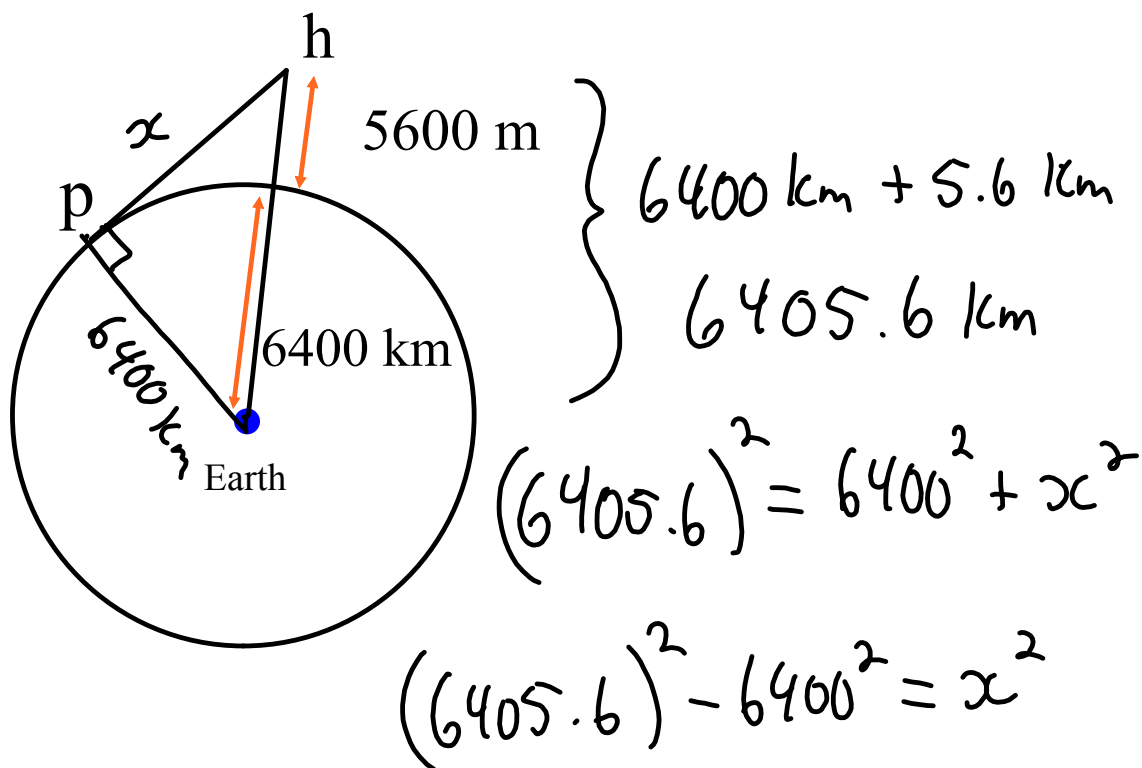
$$\sqrt{500} = x$$

Answer: OT = 22.4 cm

Solving Problems Using the Tangent and Radius Property



An airplane, h , 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, p , on the horizon she sees outside the window. Calculate this distance to the nearest kilometre.



$$(6405.6)^2 - 6400^2 = x^2$$

$$41635554.8 - 40960000 = x^2$$

$$71711.36 = x^2$$

$$\sqrt{71711.36} = x$$

$$\boxed{268 \text{ km} = x}$$



The ISS orbits at 226 km. Calculate the farthest point on the surface of the Earth that an astronaut could see.

Class/Homework

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#s 1 - 9, 13, 18.

