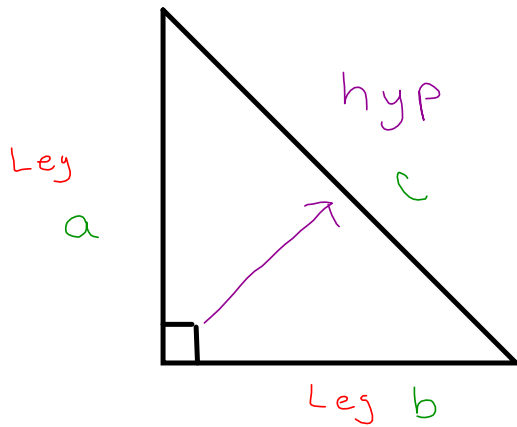




Pythagorean Theorem •

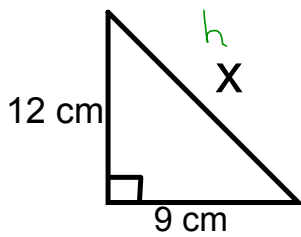
Review



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

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

1)



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

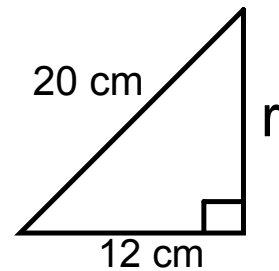
$$c^2 = 12^2 + 9^2$$

$$c^2 = 144 + 81$$

$$\sqrt{c^2} = \sqrt{225}$$

$$c = 15$$

2)



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

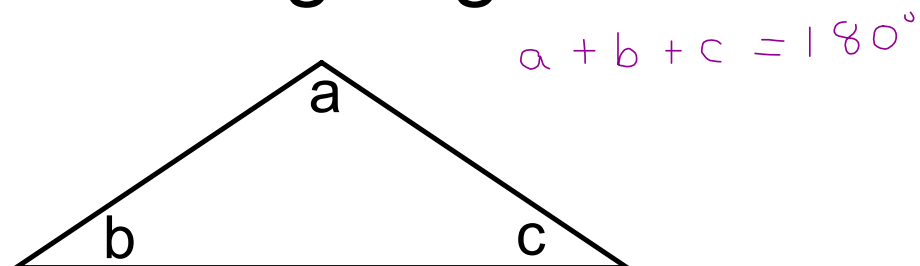
$$a^2 = 20^2 - 12^2$$

$$a^2 = 400 - 144$$

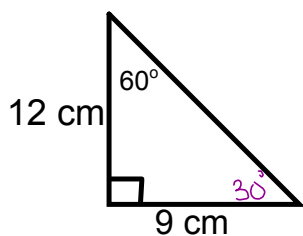
$$\sqrt{a^2} = \sqrt{256}$$

$$a = 16$$

Missing angles:

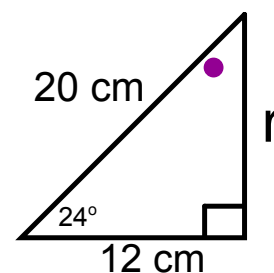


1)



$$180 - 90 - 60 \\ = 30^\circ$$

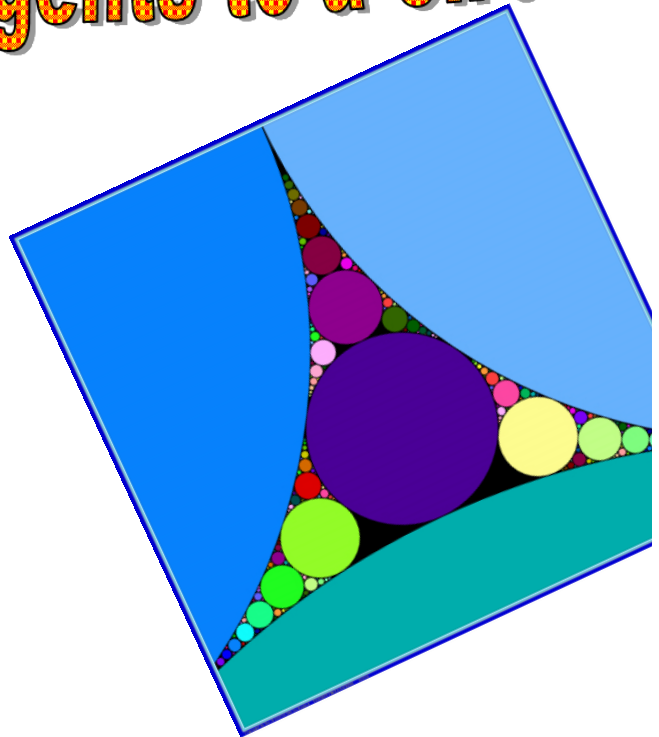
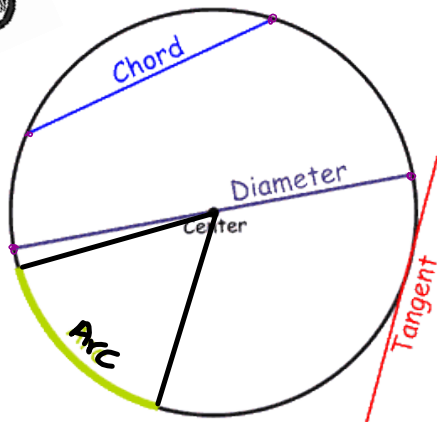
2)



$$180 - 90 - 24 \\ = 66^\circ$$

Section 8.1

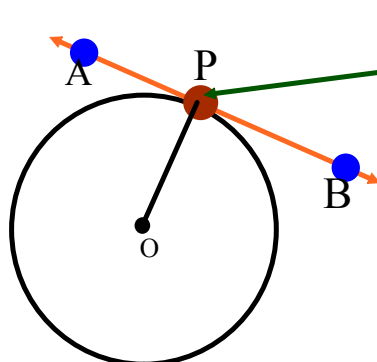
Properties of Tangents to a Circle



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:



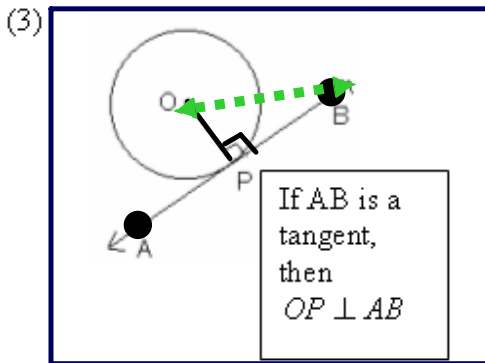
Line **AB** is a **tangent**

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

Center is Denoted by "**O**"

Tangent Property 1:

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

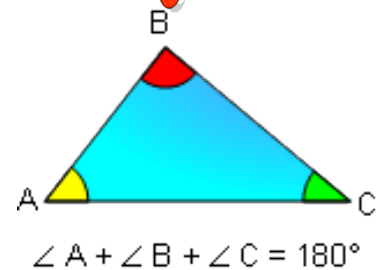


"Join O to B and you have formed a right triangle. Thus, you can use the Pythagorean Theorem to find side lengths." (OR Angle sum of triangle to find missing angles)

Determining the Measure of an Angle in a Triangle

Remember: Angles in a triangle add up to 180°

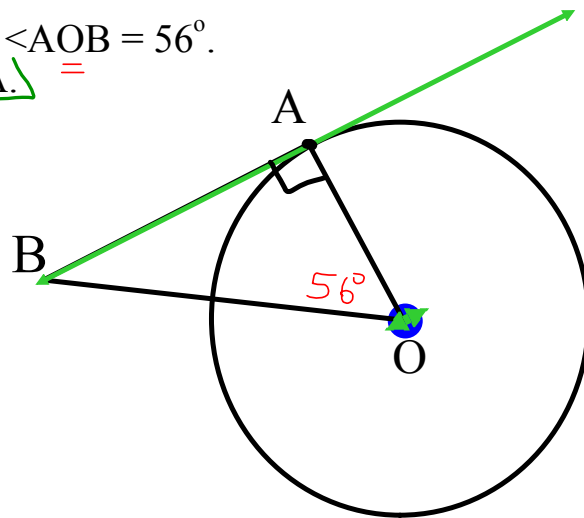
Hint: Remember tangent property 1



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 $\angle OBA$.

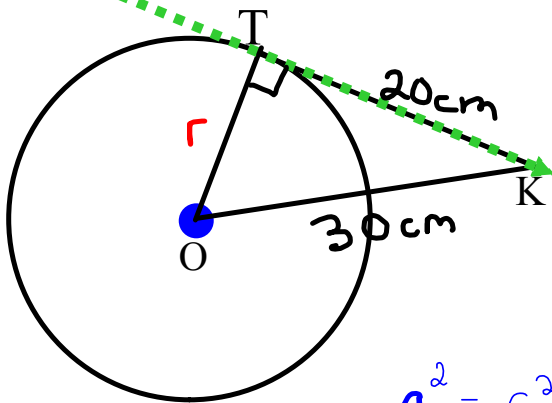
(Show all Work)

$$\begin{aligned}\angle OBA &= 180 - 90 - 56 \\ &= 34^\circ\end{aligned}$$



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) **Hint: Remember tangent property 1**



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

$$a^2 = 30^2 - 20^2$$

$$a^2 = 900 - 400$$

$$\sqrt{a^2} = \sqrt{500}$$

$$a = 22.4 \text{ cm}$$

Remember:

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

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

or

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

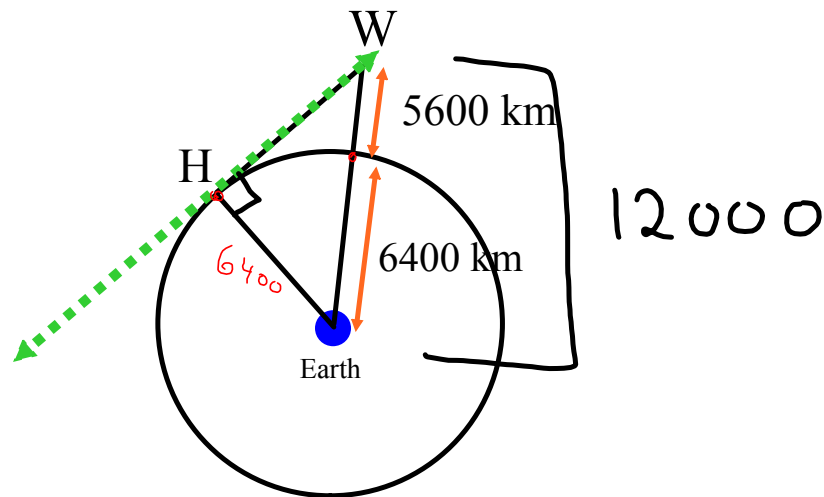


Answer: OT = 22.4 cm

Solving Problems Using the Tangent and Radius Property



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 wonders how far she is from a point H on the horizon she sees outside the window. Calculate this distance to the nearest kilometre.



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

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

$$a^2 = 144000000 - 40960000$$

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

$$a = 10150.9 \text{ km}$$

Wrap Up to Tangents



Only two ways to solve Tangent Problems:

1) Angle sum of a triangle

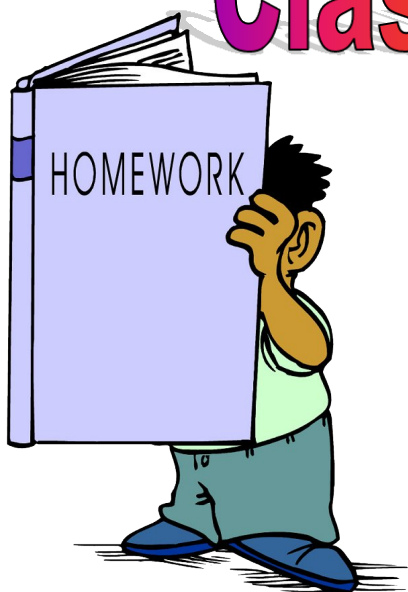
$$180^\circ - 90^\circ - \text{given angle} = \text{unknown angle}$$

2) Pythagorean Theorem

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

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

Class/Homework



Page 388-390

Day 1

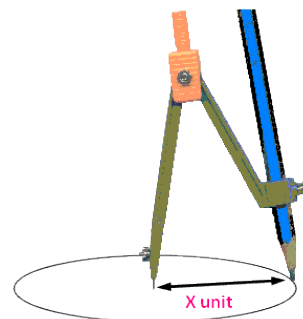
3 ab

4a

5abc sketch

6abc sketch

~~7ab sketch~~



Section 8.1 Sticky Note Activity.docx