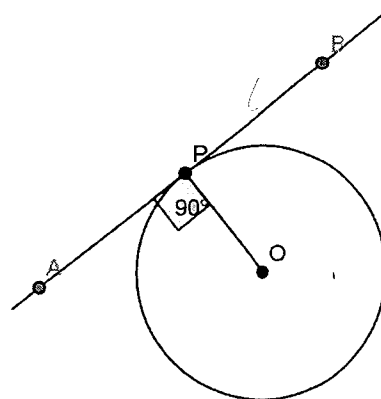


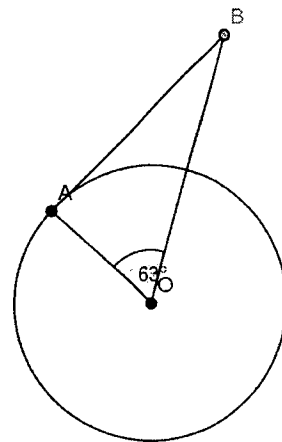
Tangent-Radius Property: a tangent is perpendicular to the radius at the point of connection. (Tangency)

So, $\angle APO = 90^\circ = \angle BPO$



- Ex. 1** Point O is the centre of the circle and AB is a tangent to the circle. In $\triangle OAB$, $\angle AOB = 63^\circ$. Determine the measure of $\angle OBA$.

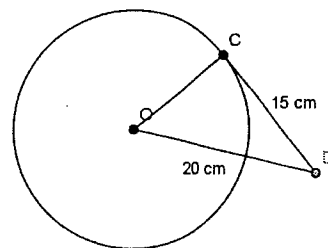
Answer: $\angle A = 90^\circ$, so all angles must add up to 180° .
 $180 - 63 - 90 = 27^\circ$
 Therefore $\angle OBA = 27^\circ$



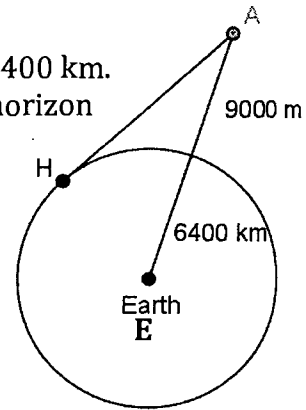
- Ex. 2** Point O is the centre of the circle and CD is a tangent to the circle. $CD = 15$ cm and $OD = 20$ cm. Determine the length of the radius OC. Give the answer to the nearest tenth.

Answer: $\angle C = 90^\circ$, use Pythagorean's Theorem

$$\begin{aligned} x^2 + 15^2 &= 20^2 \\ x^2 &= 400 - 225 \\ x^2 &= 175 \\ x &= 13.2 \text{ cm} \end{aligned}$$



Ex. 3 An airplane, A, is cruising at an altitude of 9000 m. A cross section of the 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 the distance to the nearest kilometer.



Answer: The tangent AH is perpendicular to the radius HE, therefore $\angle AHE = 90^\circ$. Use Pythagorean's Theorem to solve.

Convert 9000 m to km: $9000/1000 = 9$ km

$$x^2 + 6400^2 = 6409^2$$

$$x^2 = 41\,075\,281 - 40\,960\,000$$

$$x^2 = 115\,281$$

$$x = 340 \text{ km} \quad \text{They are about 340 km from the horizon.}$$

Assignment

Do #3 - 9, 12 - 14 p. 388