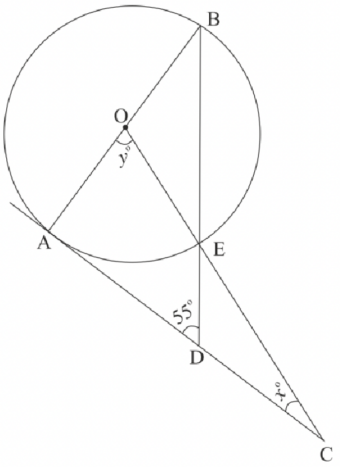
AI1103 Assignment-1
Class 10 ICSE-2019

AI21BTECH11026
SAANVI AMRUTHA

Question 7(a)
In the given figure AC is a tangent to the circle with centre O. If $\angle ADB = 55°$, find x and y. Give reasons for your answers.



Solution:
Given,
$\angle BDA = 55°$,$\angle OCA = x°$, $\angle AOE = y°$
As AC is a tangent to the given circle, $\angle OAC = \angle BAD = 90°$

Angle Sum Property for $\triangle OAC$,

$$\angle OAC + \angle OCA + \angle AOC = 180° \quad (1)$$
$$90° + x° + y° = 180° \quad (2)$$
$$x° + y° = 90° \quad (3)$$

Angle Sum Property for $\triangle ABD$,

$$\angle ABD + \angle BAD + \angle BDA = 180° \quad (4)$$
$$\angle ABD + 90° + 55° = 180° \quad (5)$$
$$\angle ABD = 35° \quad (6)$$

Let the radius of the circle be r.
$\implies OB = OE = r$
$\implies \triangle BOE$ is an isosceles triangle.
$\implies \angle ABD = \angle BEO$
In a triangle, exterior angle is equal to sum of the two opposite interior angles.

$$\implies \angle AOE = \angle ABD + \angle BEO \quad (7)$$
$$\implies y = 2(\angle ABD) \quad (8)$$
$$\implies y = 70° \quad (9)$$
$$\implies x = 20° \quad (10)$$