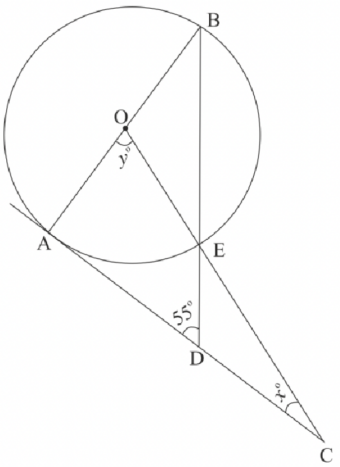
AI1103 Assignment-1
Class 10 ICSE-2019

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,

$$\angle BDA = 55° \quad (1)$$
$$\angle OCA = x° \quad (2)$$
$$\angle AOE = y° \quad (3)$$

As AC is a tangent to the given circle,

$$\angle OAC = \angle BAD = 90° \quad (4)$$

Angle Sum Property for $\triangle OAC$,

$$\angle OAC + \angle OCA + \angle AOC = 180° \quad (5)$$
$$90° + x° + y° = 180° \quad (6)$$
$$x° + y° = 90° \quad (7)$$

Angle Sum Property for $\triangle ABD$,

$$\angle ABD + \angle BAD + \angle BDA = 180° \quad (8)$$
$$\angle ABD + 90° + 55° = 180° \quad (9)$$
$$\angle ABD = 35° \quad (10)$$

Let the radius of the circle be r.

$$\implies OB = OE = r \quad (11)$$

$\implies \triangle BOE$ is an isosceles triangle.

$$\implies \angle ABD = \angle BEO \quad (12)$$

In a triangle, exterior angle is equal to sum of the two opposite interior angles.

$$\implies \angle AOE = \angle ABD + \angle BEO \quad (13)$$
$$\implies y = 2(\angle ABD) \quad (14)$$
$$\implies y = 70° \quad (15)$$
$$\implies x = 20° \quad (16)$$