

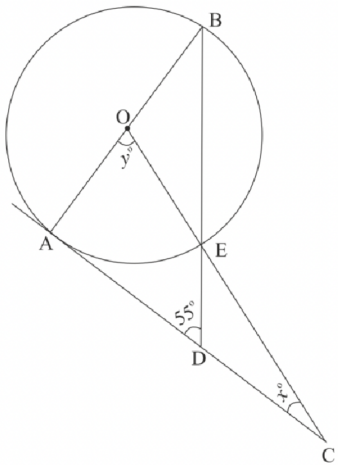
AI1103 Assignment-1

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 $\angle ADB = 55^\circ$, find x and y . Give reasons for your answers.



Solution:

Given,

$$\angle BDA = 55^\circ \quad (1)$$

$$\angle OCA = x^\circ \quad (2)$$

$$\angle AOE = y^\circ \quad (3)$$

As AC is a tangent to the given circle,

$$\angle OAC = \angle BAD = 90^\circ \quad (4)$$

Angle Sum Property for $\triangle OAC$,

$$\angle OAC + \angle OCA + \angle AOC = 180^\circ \quad (5)$$

$$90^\circ + x^\circ + y^\circ = 180^\circ \quad (6)$$

$$x^\circ + y^\circ = 90^\circ \quad (7)$$

Angle Sum Property for $\triangle ABD$,

$$\angle ABD + \angle BAD + \angle BDA = 180^\circ \quad (8)$$

$$\angle ABD + 90^\circ + 55^\circ = 180^\circ \quad (9)$$

$$\angle ABD = 35^\circ \quad (10)$$

Let the radius of the circle be r .

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

Then, $\triangle BOE$ is an isosceles triangle.

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

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

$$\Rightarrow \angle AOE = \angle ABD + \angle BEO \quad (13)$$

$$\Rightarrow y = 2(\angle ABD) \quad (14)$$

$$\Rightarrow y = 70^\circ \quad (15)$$

$$\Rightarrow x = 20^\circ \quad (16)$$