

CHAPTER 11

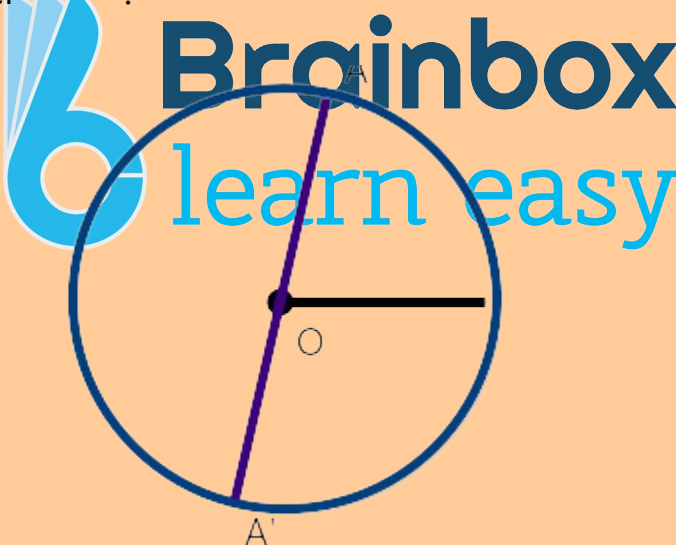
Constructions

V. Construction of tangents to a circle when angle between them is given, Say ' θ ' :

Steps of construction:

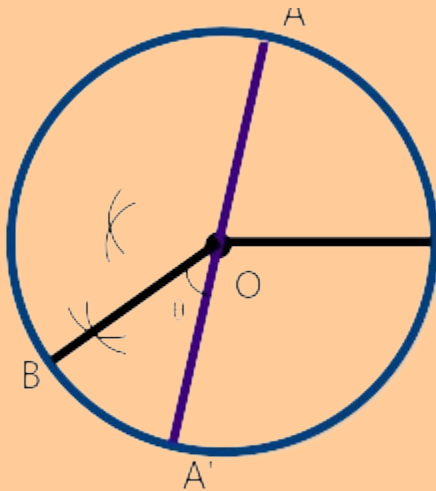
Step I:

Draw a circle with centre at 'O' and radius 'r' cm. Draw a diameter $\overline{AA'}$.

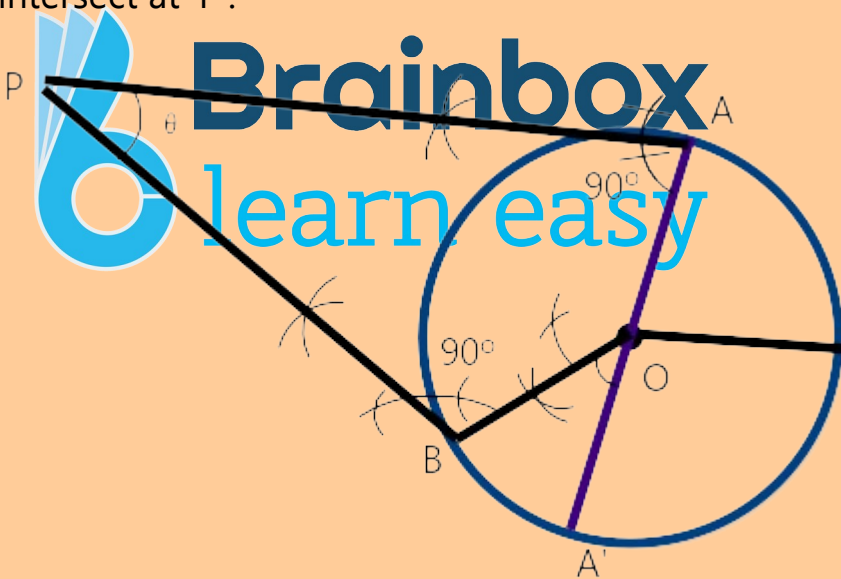


Step II:

At 'O', construct $\angle A'OB = \theta$ and let OB intersect the circle at 'B'.

**Step III:**

Draw perpendiculars to OA and OB at A and B respectively. Let them intersect at 'P'.



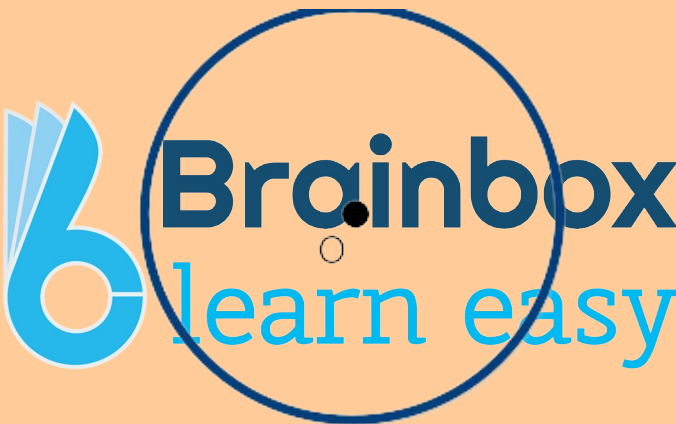
Thus, PA and PB is a pair of tangents to the circle and they are inclined to each other at angle θ .

Example:

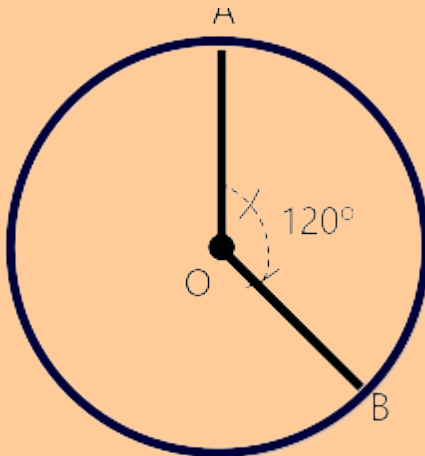
Draw a pair of triangles to a circle of radius 5 cm. Which are inclined to each other at an angle of 60° .

Sol.**Steps of construction:****Step I:**

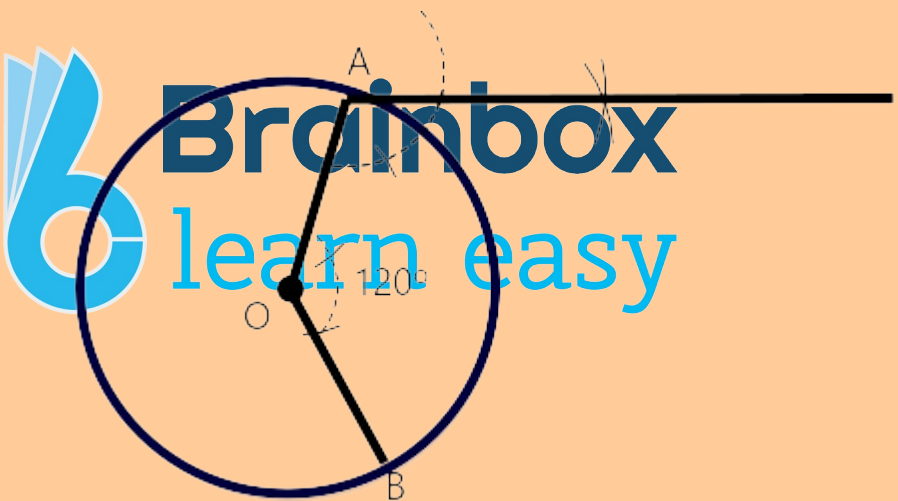
With centre 'O' and radius 5 cm, draw a circle.

**Step II:**

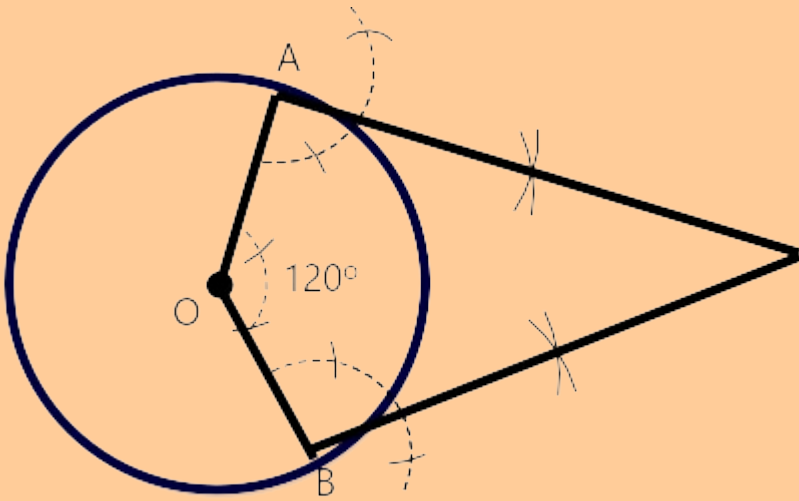
Taking a point A on the circle draw $\angle AOB = 120^\circ$.

**Step III:**

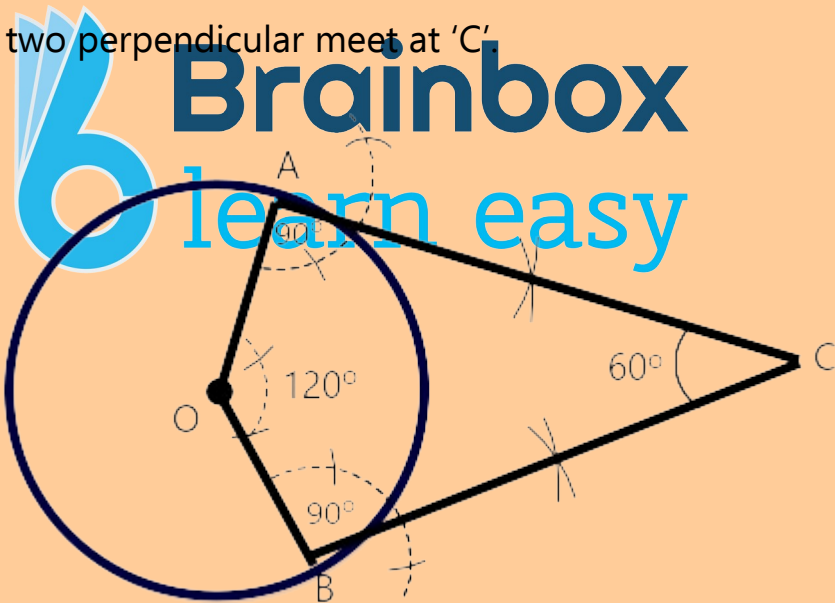
Draw a perpendicular on OA at 'A'.

**Step IV:**

Draw another perpendicular on OB at B.

**Step V:**

Let the two perpendicular meet at 'C'



Thus, CA and CB are the two required tangents to the given circle, which are inclined to each other at 60° .

Justification:

In a quadrilateral OACB, using angle sum property, we have

$$120^\circ + 90^\circ + 90^\circ + \angle ACB = 360^\circ$$

$$\Rightarrow 300^\circ + \angle ACB = 360^\circ$$

$$\Rightarrow \angle ACB = 360^\circ - 300^\circ$$

$$\therefore \angle ACB = 60^\circ$$

