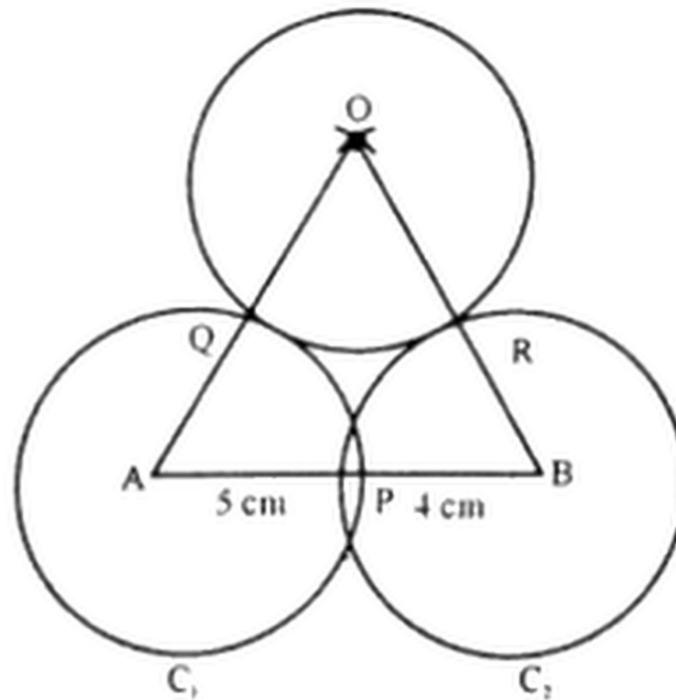


Exercise 10.3

1. Two circles with radii 5cm and 4cm touch each other externally. Draw another circle with radius 2.5cm touching the first pair, externally.



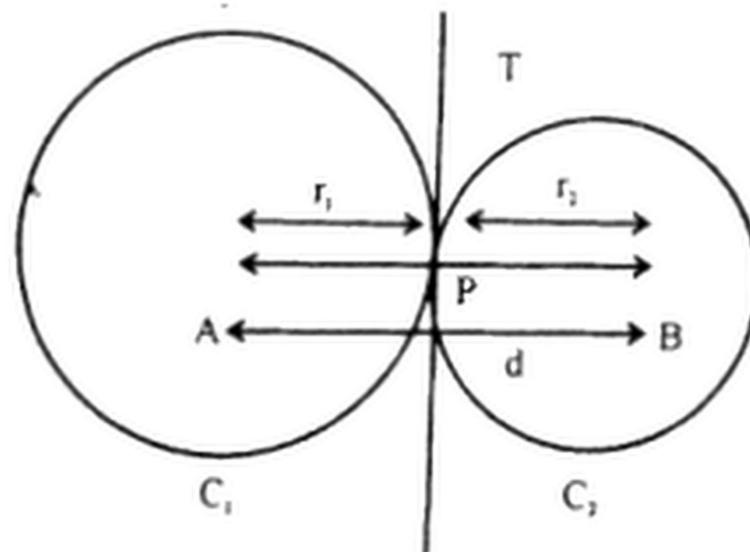
Solution:

Construction:

1. Draw two circles C_1 and C_2 having radius 5cm and 4cm touch each other at point P.
2. Draw an arc having radius of 7.5 cm from point A and another arc from point B having radius 6.5cm cut each other at point O.
3. With a radius of 2.5 draw a circle from point 'O' which touches the circles C_1 and C_2 at 'Q' and 'R'.

Hence it is required circle.

2. If the distance between the centers of two circles is the sum or the difference of their radii, they will touch each other.



Solution:

Given:

Two circles with centers 'A' and 'B' touch each other at P.

To prove:

$$d = r_1 + r_2$$

Construction:

AP is the radius and PT, the common tangent at the point P to both the circles.

Proof:

Since AP is the radius at P and PT is tangent at the point 'P' therefore

$$\angle APT = 90^\circ \quad \text{_____ (i)}$$

$$\text{and } \angle BPT = 90^\circ \quad \text{_____ (ii)}$$

By adding (i) and (ii), we have

$$\angle APT + \angle BPT = 180^\circ$$

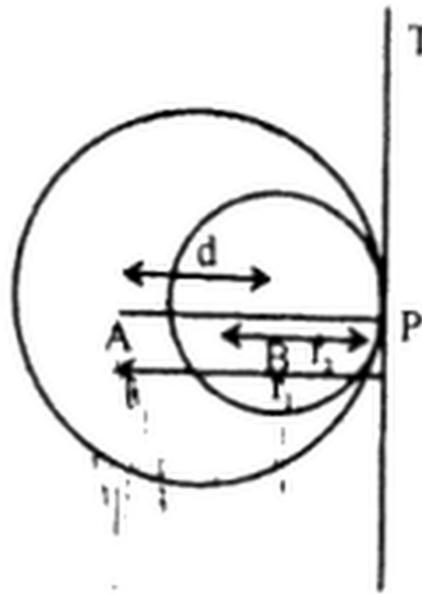
$$\Rightarrow \text{APB is a straight line.}$$

If r_1 and r_2 are the radii of two circles and d , the distance between the two centers. Then the two circles touch externally.

$$d = r_1 + r_2$$

Hence proved

(b) To prove, $d = r_1 - r_2$



If r_1 and r_2 are the radii of two circles and d , the distance between the two centers, then the two circles touch internally.

$$d = r_1 - r_2$$

Hence proved

