Mathematics

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(Chapter – 10) (Circles)
(Class X)

Exercise 10.1

Question 1:

How many tangents can a circle have?

Answer 1:

A circle can have infinite number of tangents because a circle have infinite number of points on it and at every point a tangent can be drawn.

Question 2:

Fill in the blanks:

(i) A tangent to a circle intersects it in _____ point (s).

(ii) A line intersecting a circle in two points is called a _____.

(iii) A circle can have _____ parallel tangents at the most.

(iv) The common point of a tangent to a circle and the circle is called _____.

Answer 2:

(i) A tangent to a circle intersects it in ***one*** point (s).

(ii) A line intersecting a circle in two points is called a ***Secant***.

(iii) A circle can have ***two*** parallel tangents at the most.

(iv) The common point of a tangent to a circle and the circle is called ***point of contact***.

Question 3:

A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. Length PQ is:

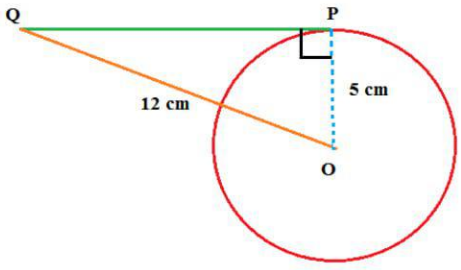
(A) 12 cm (B) 13 cm (C) 8.5 cm (D) $\sqrt{119}$ cm.

Answer 3:

(D) $\sqrt{119}$ cm.

Solution:

In ΔOPQ, angle P is right angle. [Since radius is perpendicular to tangent]



Using Pythagoras theorem, $OQ^2 = PQ^2 + OP^2$

$\Rightarrow 12^2 = PQ^2 + 5^2$

$\Rightarrow 144 = PQ^2 + 25$

$\Rightarrow PQ^2 = 144 - 25 = 119$

$\Rightarrow PQ = \sqrt{119}$

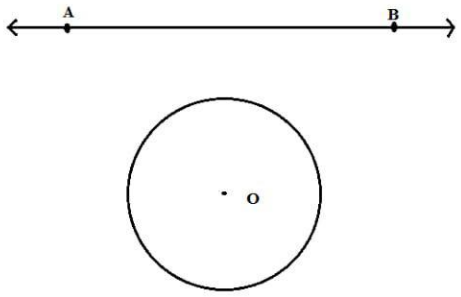
Hence, the option (D) is correct.

Question 4:

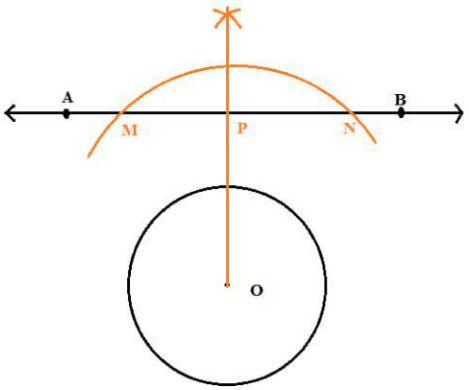
Draw a circle and two lines parallel to a given line such that one is a tangent and the other, a secant to the circle.

Answer 4:

Consider a circle with centre O. Let AB is the given line.



Now draw a perpendicular from O to line AB, which intersect AB at P.



Now take two points on the line PO, one at circle X and another Y inside the circle. Draw lines parallel to AB and passing through X and Y. CD and EF are the required lines.