

MATHEMATICS • CLASS 10

CHAPTER 10

Circles

NCERT SOLUTIONS



EXERCISE 10.1 – Q1 & Q2

Q1. How many tangents can a circle have?

Answer: Infinitely many.

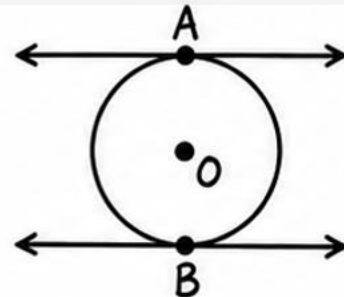
A circle has infinitely many points, and one tangent can be drawn at each point.

Q2. Fill in the blanks.

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

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

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



Answer: Two.

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

Answer: Point of contact.

EXERCISE 10.1 – Q3

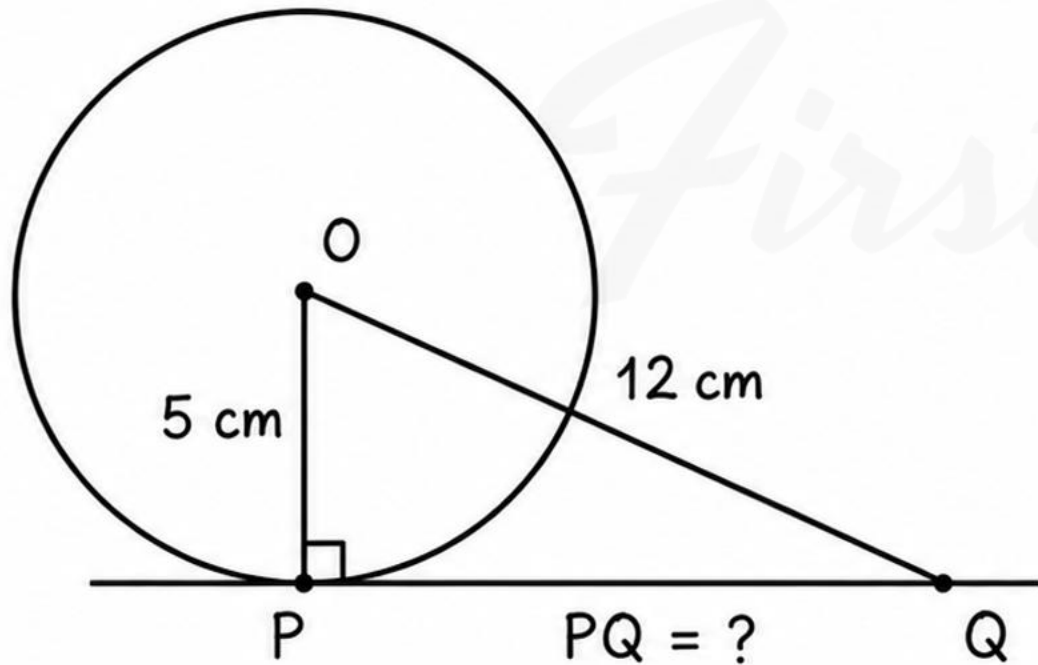
Q3. A tangent PQ at P to a circle of radius 5 cm meets a line through centre O at Q. If OQ = 12 cm, find PQ.

(A) 12 cm

(B) 13 cm

(C) 8.5 cm

(D) $\sqrt{119}$ cm



Not to scale.

OP is a radius to the point of contact, so $OP \perp PQ$.

In right triangle OPQ:

$$OQ^2 = OP^2 + PQ^2$$

$$PQ^2 = 12^2 - 5^2$$

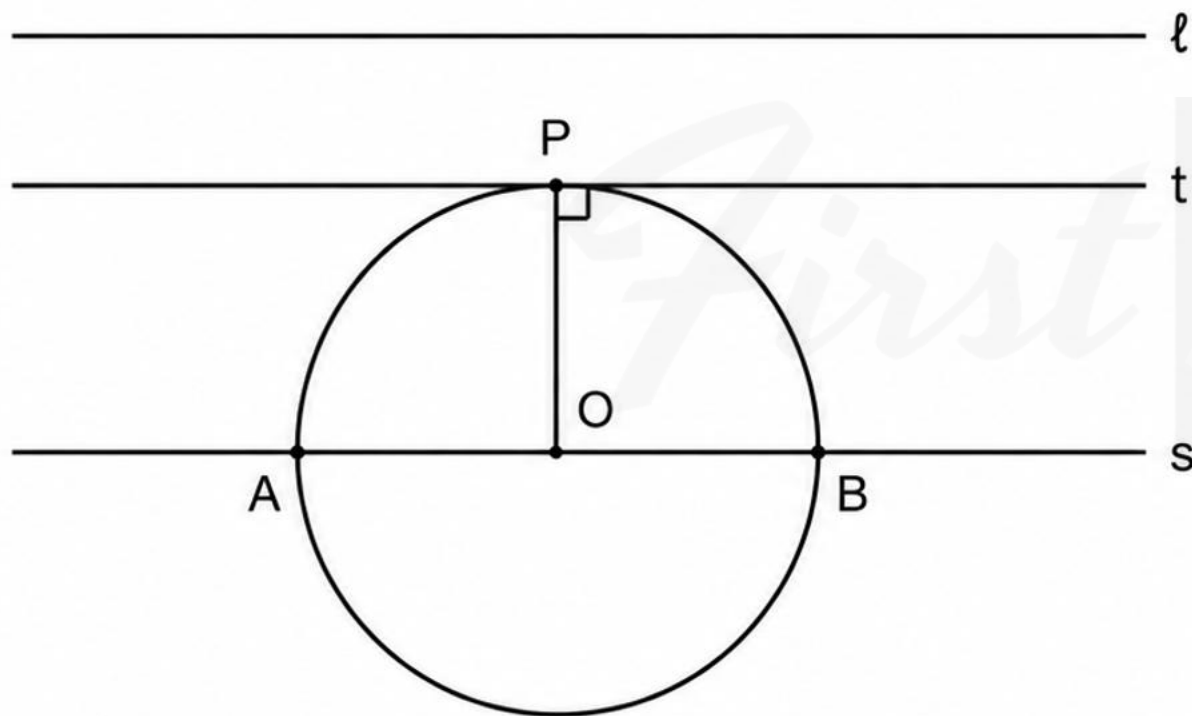
$$= 144 - 25 = 119$$

$$PQ = \sqrt{119} \text{ cm}$$

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

EXERCISE 10.1 — Q4

Q4. Draw a circle and two lines parallel to a given line such that one is a tangent and the other is a secant.



$t \parallel s \parallel \ell$

Not to scale.

Steps:

1. Draw the given line ℓ and choose a centre O away from it.
2. Draw a circle with centre O .
3. Draw OP perpendicular to ℓ , meeting the circle at P on the nearer side.
4. Through P , draw t parallel to ℓ . Since $OP \perp t$, t is a tangent at P .
5. Through O , draw s parallel to ℓ . It cuts the circle at A and B , so s is a secant.

Thus $t \parallel s \parallel \ell$, with the required tangent and secant.

EXERCISE 10.2 — Q1

Q1. From Q, the tangent to a circle is 24 cm long. Q is 25 cm from the centre. Find the radius and justify the choice.

- (A) 7 cm (B) 12 cm (C) 15 cm (D) 24.5 cm

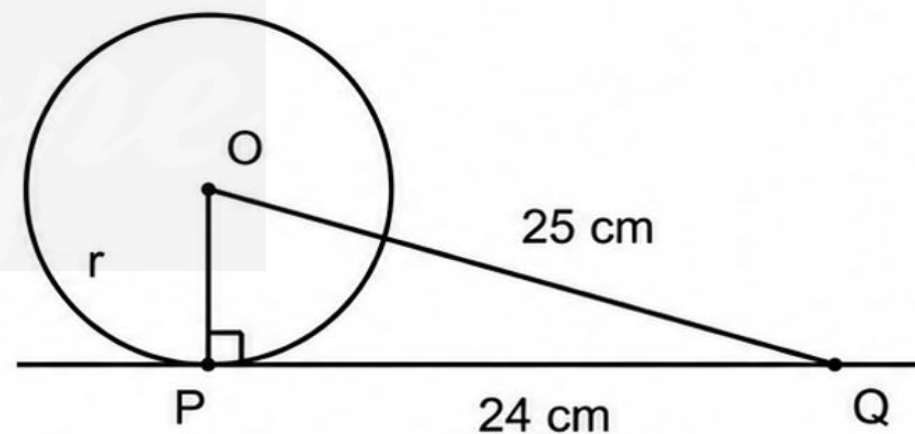
Let P be the point of contact and O the centre.

$OP \perp PQ$, so triangle OPQ is right-angled at P.

$$\begin{aligned} OP^2 &= OQ^2 - PQ^2 \\ &= 25^2 - 24^2 \\ &= 625 - 576 = 49 \end{aligned}$$

$$OP = 7 \text{ cm}$$

Answer: (A) 7 cm.



Not to scale.

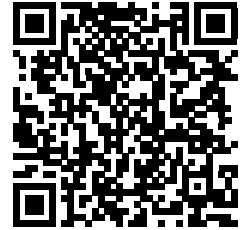


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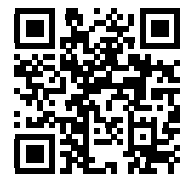


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