

Circles - NCERT Examples

Examples 1-3 with independently verified solutions.

CHAPTER

Circles

RESOURCE

NCERT Examples

SOURCE

NCERT Mathematics, Reprint 2026-27

PART 1

Verified NCERT questions and solutions

Verified NCERT questions and solutions

Solutions are checked independently and follow the supplied NCERT chapter edition.

NCERT EXAMPLE

Example 1

concentric circles · perpendicular chord theorem

Prove that in two concentric circles, a chord of the larger circle that touches the smaller circle is bisected at the point of contact.

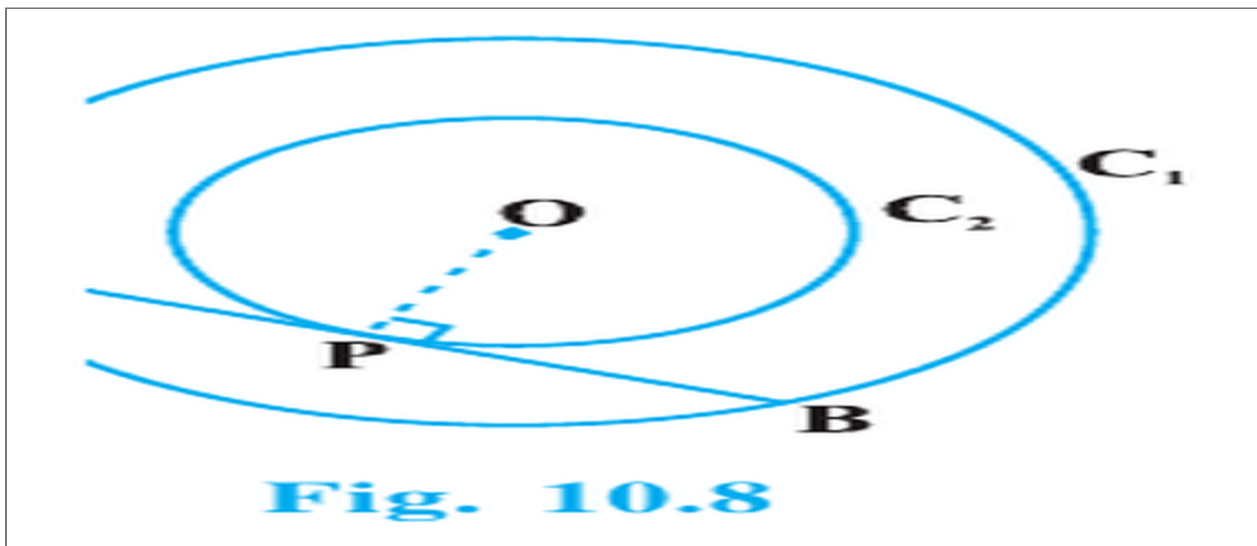


Figure 10-8 from the supplied NCERT chapter.

Solution

Board-exam working:

Let the two circles have common centre O . Chord AB of the larger circle touches the smaller circle at P .

Join OP.

Since AB is tangent to the smaller circle at P, its radius OP is perpendicular to AB.

$$OP \perp AB$$

AB is also a chord of the larger circle. The perpendicular from the centre of a circle to a chord bisects the chord.

$$AP = PB$$

Final answer

Hence, the chord AB is bisected at P.

NCERT EXAMPLE

Example 2

two tangents · angle proof

Two tangents TP and TQ are drawn from an external point T to a circle with centre O. Prove that $\angle PTQ = 2\angle OPQ$.

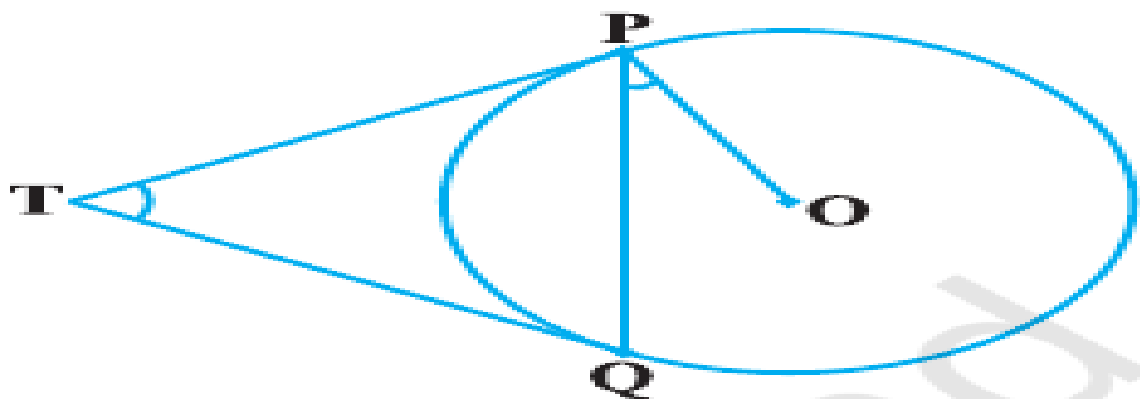


Fig. 10.9

Figure 10-9 from the supplied NCERT chapter.

Solution

Board-exam working:

Let $\angle PTQ = \theta$.

Tangents from the same external point are equal.

$$TP = TQ$$

Therefore, triangle TPQ is isosceles.

$$\angle TPQ = \angle TQP = \frac{180^\circ - \theta}{2} = 90^\circ - \frac{\theta}{2}$$

The radius OP is perpendicular to tangent TP.

$$\angle OPT = 90^\circ$$

$$\angle OPQ = \angle OPT - \angle TPQ$$

$$= 90^\circ - \left(90^\circ - \frac{\theta}{2}\right) = \frac{\theta}{2}$$

$$\theta = 2\angle OPQ$$

$$\therefore \angle PTQ = 2\angle OPQ$$

Final answer

Hence proved: $\angle PTQ = 2\angle OPQ$.

NCERT EXAMPLE

Example 3

chord · tangent length

PQ is a chord of length 8 cm in a circle of radius 5 cm. The tangents at P and Q meet at T. Find TP.

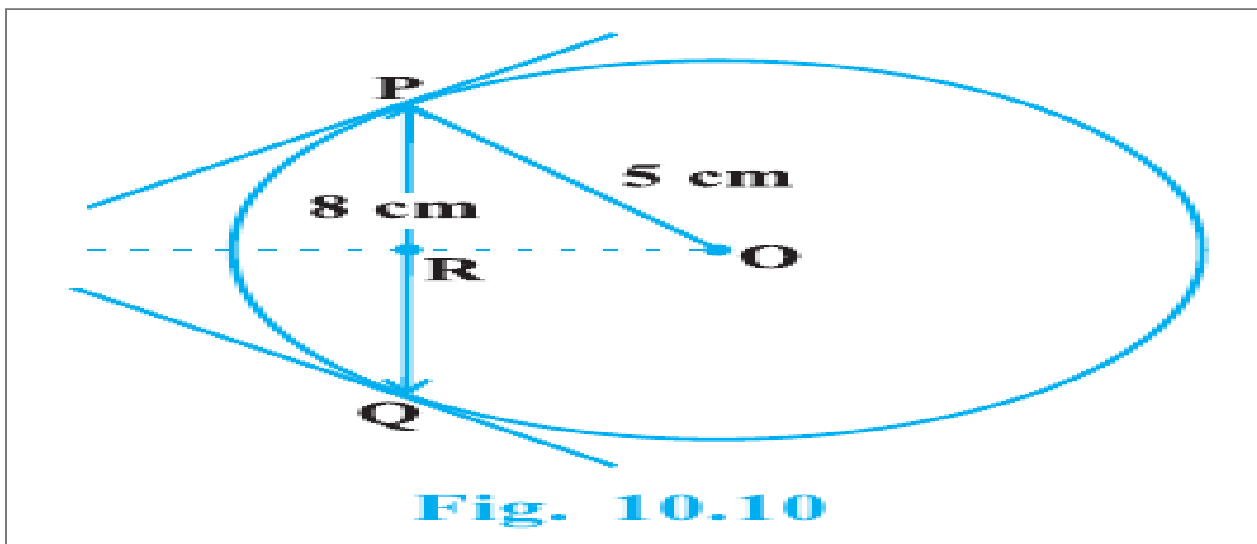


Figure 10-10 from the supplied NCERT chapter.

Solution

Board-exam working:

Join OT and let it meet PQ at R.

Since $TP = TQ$, triangle TPQ is isosceles. OT bisects $\angle PTQ$ and is perpendicular to PQ .

$$PR = RQ = \frac{8}{2} = 4 \text{ cm}$$

In right triangle OPR:

$$OR = \sqrt{OP^2 - PR^2}$$

$$= \sqrt{5^2 - 4^2} = 3 \text{ cm}$$

Triangles TRP and PRO are similar by AA similarity.

$$\frac{TP}{PO} = \frac{PR}{RO}$$

$$\frac{TP}{5} = \frac{4}{3}$$

$$TP = \frac{20}{3} \text{ cm}$$

Final answer

$$TP = \frac{20}{3} \text{ cm}$$