

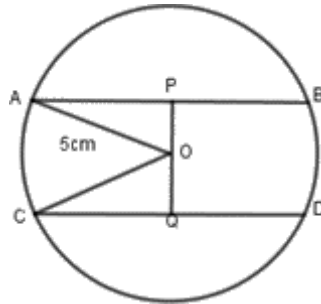
FlexiPrep

CBSE Class 10-Mathematics: Questions and Answers Chapter – 10 Circles Part 8 (For CBSE, ICSE, IAS, NET, NRA 2022)

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Question 14:

In the given figure, O is the center of the circle with radius 5 cm and $AB \parallel CD$. If $AB = 6$ cm, find OP.



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Answer:

$$\because OP \perp AB$$

$$\therefore OP \text{ bisects } AB$$

$$\therefore AP = \frac{1}{2}AB = \frac{1}{2} \times 6 = 3 \text{ cm}$$

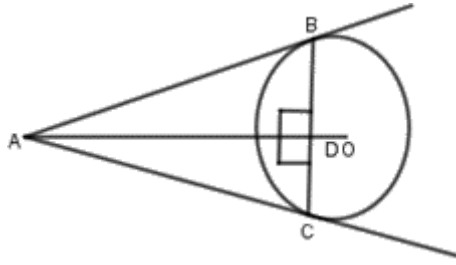
$$\text{From right } \triangle OAP, OA^2 = OP^2 + AP^2$$

$$\Rightarrow 5^2 = OP^2 + 3^2$$

$$\Rightarrow OP = 4 \text{ cm}$$

Question 15:

Prove that the tangents at the end of a chord of a circle make equal angles with the chord.



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Answer:

In $\triangle ADB$ and $\triangle ADC$

$$BD = DC$$

And $\angle ADB = \angle ADC = 90^\circ$

$AD = AD$ [Common]

$$\therefore \triangle ADB \cong \triangle ADC \text{ [SAS]}$$

$$\therefore \angle ABD = \angle ACD \text{ [By CPCT]}$$

Question 16:

Find the locus of the center of circles which touch a given line at a given point.

Answer:

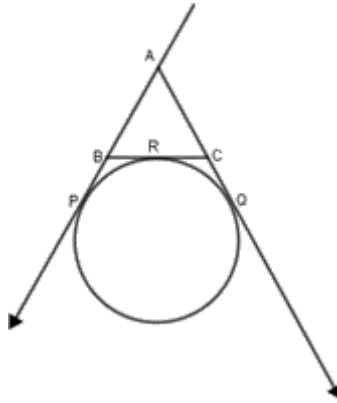
Let APB be the given line and let a circle with center O touch APB at P. Then $\angle OPB = 90^\circ$, let there be another circle with center O' which touches the line APB at P.

Thus, $\angle O'PB = 90^\circ$

$$\therefore \angle OPB = \angle O'PB = 90^\circ$$

Question 17:

In the given figure, find the perimeter of $\triangle ABC$, if $AP = 10$ cm .



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Answer:

\therefore BC touches the circle at R

\therefore Tangents drawn from external point to the circle are equal.

$$\therefore AP = AQ, BR = BP$$

And $CR = CQ$

\therefore Perimeter of $\triangle ABC = AB + BC + AC$

$$= AB + (BR + RC) + AC$$

$$= AB + BP + CQ + AC$$

$$= AP + AQ = 2AP = 2 \times 10 = 20 \text{ cm}$$

Question 18:

If PA and PB are tangents drawn from external point P such that $PA = 10 \text{ cm}$ and $\angle APB = 60^\circ$, find the length of chord AB.

Answer:

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

$$\angle AOB = 120^\circ [O \text{ is centre of circle}]$$

$$\angle OAB = \angle OBA = 30^\circ$$

$$\therefore \angle PAB = 60^\circ, \angle PBA = 60^\circ$$

$\therefore \triangle PAB$ is equilateral triangle

$$\therefore AB = PA = 10 \text{ cm}$$

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