

CLASS 10 — MATHEMATICS

Chapter: Circles

Practice Worksheet | CBSE Pattern

Maximum Marks: 40

Time Allowed: 1 hour 30 minutes

Name: _____

Class/Section: _____ Date: _____

General Instructions:

1. All questions are compulsory.
2. Read each question carefully before answering.
3. Show complete working for questions requiring calculations or proofs.
4. Select only one option for each MCQ.
5. Marks for each question are indicated alongside the question.
6. Write mathematical steps clearly and use appropriate notation.

This paper has 21 questions in five sections: A (Q1–Q10, 1 mark each), B (Q11–Q15, 2 marks each), C (Q16–Q19, 3 marks each), D (Q20, 4 marks) and E (Q21, case study, 4 marks). Draw a neat figure wherever required. Figures are not drawn to scale.

SECTION A

Multiple Choice Questions — Q1 to Q10 carry 1 mark each.

- Q1.** The number of tangents that can be drawn to a circle from a point inside the circle is **[1 mark]**
(A) 0 (B) 1
(C) 2 (D) infinitely many
- Q2.** The length of the tangent from a point 13 cm away from the centre of a circle of radius 5 cm is **[1 mark]**
(A) 8 cm (B) 18 cm
(C) 12 cm (D) $\sqrt{194}$ cm
- Q3.** The angle between a tangent to a circle and the radius at the point of contact is **[1 mark]**
(A) 60° (B) 90°
(C) 45° (D) 180°
- Q4.** PA and PB are tangents from P to a circle with centre O. If $\angle APB = 70^\circ$, then $\angle AOB$ is **[1 mark]**
(A) 70° (B) 140°
(C) 90° (D) 110°
- Q5.** The maximum number of tangents to a circle that can be parallel to a given line is **[1 mark]**
(A) 1 (B) 2
(C) infinitely many (D) 0

- Q6.** Two concentric circles have radii 10 cm and 6 cm. The length of the chord of the larger circle that touches the smaller circle is [1 mark]
 (A) 8 cm (B) 12 cm
 (C) 16 cm (D) $2\sqrt{34}$ cm
- Q7.** A quadrilateral ABCD is drawn to circumscribe a circle. If AB = 6 cm, BC = 7 cm and CD = 4 cm, then AD is [1 mark]
 (A) 3 cm (B) 5 cm
 (C) 9 cm (D) 17 cm
- Q8.** PA and PB are tangents from an external point P to a circle with centre O. If $\angle APB = 60^\circ$ and OP = 10 cm, the radius of the circle is [1 mark]
 (A) $5\sqrt{3}$ cm (B) 10 cm
 (C) 2.5 cm (D) 5 cm

In Q9 and Q10, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

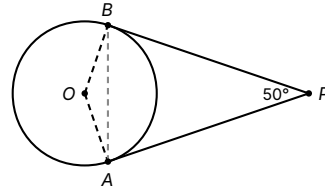
- Q9. Assertion (A):** The tangents drawn at the ends of a diameter of a circle are parallel. [1 mark]
Reason (R): Both tangents are perpendicular to the same diameter.
 (A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
 (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
 (C) Assertion (A) is true, but Reason (R) is false.
 (D) Assertion (A) is false, but Reason (R) is true.
- Q10. Assertion (A):** Exactly one tangent can be drawn to a circle from a point inside it. [1 mark]
Reason (R): There is exactly one tangent at any point on a circle.
 (A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
 (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
 (C) Assertion (A) is true, but Reason (R) is false.
 (D) Assertion (A) is false, but Reason (R) is true.

SECTION B

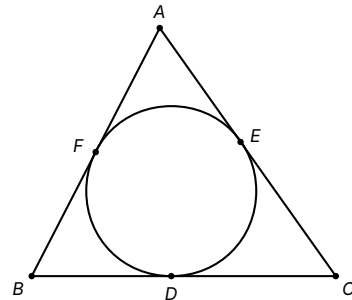
Very Short Answer Questions — Q11 to Q15 carry 2 marks each.

- Q11.** The length of the tangent to a circle from a point 17 cm away from its centre is 15 cm. Find the radius of the circle. **[2 marks]**

- Q12.** In the figure, PA and PB are tangents from P to a circle with centre O. If $\angle APB = 50^\circ$, find $\angle OAB$. **[2 marks]**



- Q13.** In the figure, a circle is inscribed in $\triangle ABC$, touching BC, CA and AB at D, E and F respectively. If $AF = 4$ cm, $BD = 6$ cm and $CE = 5$ cm, find the perimeter of $\triangle ABC$. **[2 marks]**



- Q14.** TP and TQ are tangents from an external point T to a circle with centre O. Prove that $\angle POT = \angle QOT$. **[2 marks]**

- Q15.** A point P is 25 cm from the centre O of a circle of radius 7 cm. PA and PB are tangents to the circle. Find the perimeter of the quadrilateral OAPB. **[2 marks]**

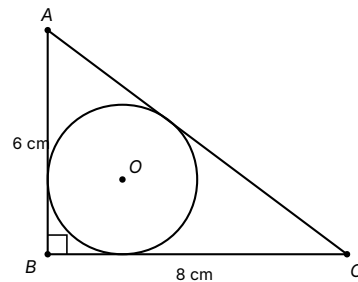
SECTION C

Short Answer Questions — Q16 to Q19 carry 3 marks each.

- Q16.** Prove that the lengths of the tangents drawn from an external point [3 marks] to a circle are equal.

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- Q17.** A circle is inscribed in $\triangle ABC$, touching AB, BC and CA at P, Q and R [3 marks] respectively. If $AB = 10$ cm, $BC = 8$ cm and $CA = 12$ cm, find the lengths AP, BQ and CR.

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- Q18.** $\triangle ABC$ is right-angled at B, with $AB = 6$ cm and $BC = 8$ cm. A circle [3 marks] with centre O is inscribed in $\triangle ABC$. Find the radius of the circle.

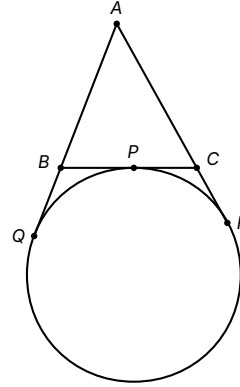


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- Q19.** Two tangents PA and PB are drawn from an external point P to a [3 marks] circle with centre O and radius r . If $OP = 2r$, show that $\triangle APB$ is equilateral.

SECTION D

Long Answer Question — Q20 carries 4 marks.

- Q20.** In the figure, a circle touches the side BC of $\triangle ABC$ at P, and touches AB produced at Q and AC produced at R. Prove that $AQ = \frac{1}{2}$ (perimeter of $\triangle ABC$). Hence find AQ if $AB = 7$ cm, $BC = 6$ cm and $CA = 5$ cm. **[4 marks]**

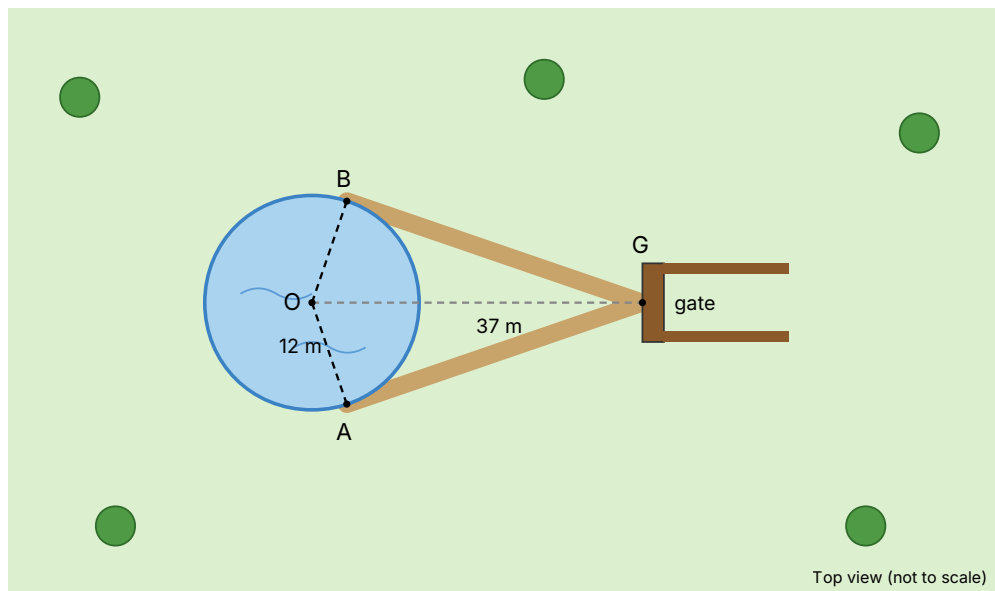


SECTION E

Case Study Based Question — Q21 carries 4 marks.

- Q21.** A circular pond in a park has centre O and radius 12 m. Two straight paths start from the gate G, which is 37 m from O, and touch the edge of the pond at A and B, as shown.

[4 marks]



Based on the above information, answer the following questions:

- (i) What is the measure of $\angle OAG$? Give a reason. **[1 mark]**
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- (ii) Find the length of the path GA. **[1 mark]**
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- (iii) A fence is to be put along OA, AG, GB and BO. Find the total length of the fence and the area of the region OAGB. **[2 marks]**
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— End of Question Paper —