

Time : 1 Hour 30 Minute

STD 10 Maths
Chapter Based Test

Total Marks : 50

Section A

* Choose the right answer from the given options. [1 Marks Each] [7]

1. Which of the following statements is not true?

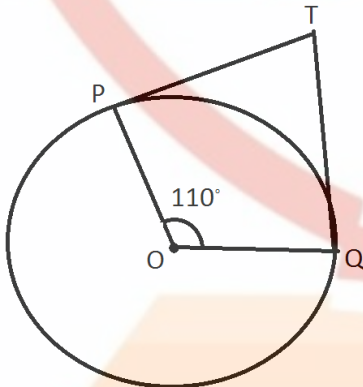
- | | | | |
|---|--|---|--|
| (A) A tangent to a circle intersects the circle exactly at one point. | (B) The point common to a circle and its tangent is called the point of contact. | (C) The tangent at any point of a circle is perpendicular to the radius of the circle through the point of contact. | (D) A straight line can meet a circle at one point only. |
|---|--|---|--|

2. 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. |
|-----------|-----------|------------|----------------------|

3. Choose the correct option and give justification.

In Fig., if TP and TQ are the two tangents to a circle with centre O so that $\angle POQ = 110^\circ$, then $\angle PTQ$ is equal to:



- | | | | |
|----------------|----------------|----------------|----------------|
| (A) 60° | (B) 70° | (C) 80° | (D) 90° |
|----------------|----------------|----------------|----------------|

4. If angle between two radii of a circle is 130° , the angle between the tangent at the ends of radii is:

- | | | | |
|----------------|----------------|----------------|----------------|
| (A) 90° | (B) 50° | (C) 70° | (D) 40° |
|----------------|----------------|----------------|----------------|

5. Each question consists of two statements, namely, Assertion (A) and Reason (R). for selecting the correct answer, use the following code:

Assertion (A)	Reason (R)
At a point P of a circle with centre O and radius 12cm, a tangent PQ of length 16cm is drawn. Then, the point of contact. $OQ = 20$ cm.	The tangent at any point of a circle is perpendicular to the radius through the point of contact.

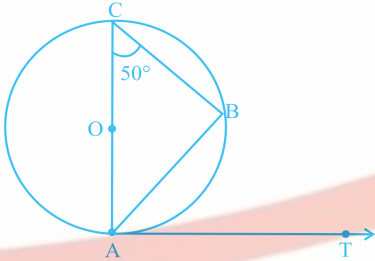
(A) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

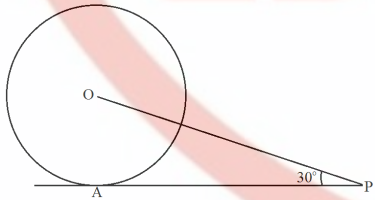
(C) Assertion (A) is true and Reason (R) is false.

(D) Assertion (A) is false and Reason (R) is true.

6. In figure, AB is a chord of the circle and AOC is its diameter such that $\angle ACB = 50^\circ$. If AT is the tangent to the circle at the point A, then $\angle BAT$ is equal to:



- a. 65°
b. 60°
c. 50°
d. 40°
7. In the figure, AP is a tangent to the circle with centre O such that $OP = 4\text{cm}$ and $\angle OPA = 30^\circ$. Then, $AP =$
- a. $2\sqrt{2}\text{cm}$
b. 2cm
c. $2\sqrt{3}\text{cm}$
d. $3\sqrt{2}\text{cm}$



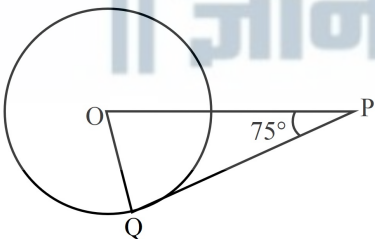
* A statement of Assertion (A) is followed by a statement of Reason (R).

[3]

Choose the correct option.

8. **Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

Assertion: In the given figure, if PQ is a tangent to the circle with centre O, then the value of $\angle POQ$ is 25°



Reason: If two tangents are drawn to a circle from an external point, then they subtend equal angles at the centre.

- a. Assertion and Reason both are correct statements and Reason is the correct explanation of Assertion.

- b. Assertion and Reason both are correct statements but Reason is not the correct explanation of Assertion.
- c. Assertion is correct statement but Reason is wrong statement.
- d. Assertion is wrong statement but Reason is correct statement.

9. **Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

Assertion: If TP and TQ are the two tangents to a circle with centre O so that $\angle POQ = 123^\circ$, then $\angle PTQ = 57^\circ$

Reason: The tangent at any point of a circle is perpendicular to the radius through the point of contact.

- a. Assertion and Reason both are correct statements and Reason is the correct explanation of Assertion.
- b. Assertion and Reason both are correct statements but Reason is not the correct explanation of Assertion.
- c. Assertion is correct statement but Reason is wrong statement.
- d. Assertion is wrong statement but Reason is correct statement.

10. **Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

Assertion: At a point P of a circle with centre O and radius 12cm, a tangent PQ of length 16cm is drawn. Then, $OQ = 20\text{cm}$.

Reason: The tangent at any point of a circle is perpendicular to the radius through the point of contact.

- a. Assertion and Reason both are correct statements and Reason is the correct explanation of Assertion.
- b. Assertion and Reason both are correct statements but Reason is not the correct explanation of Assertion.
- c. Assertion is correct statement but Reason is wrong statement.
- d. Assertion is wrong statement but Reason is correct statement.

* **State whether the following sentences are True or False. [1 Marks Each] [2]**

11. Write 'True' or 'False' and justify your answer.
If angle between two tangents drawn from a point P to a circle of radius a and centre O is 60° , then $OP = a\sqrt{3}$.

12. Write 'True' or 'False' and justify your answer.
The tangent to the circumcircle of an isosceles triangle $\triangle ABC$ at A, in which $AB = AC$, is parallel to BC.

* **Answer the following questions in one sentence. [1 Marks Each] [2]**

13. Fill in the blanks:
A line intersecting a circle in two points is called a

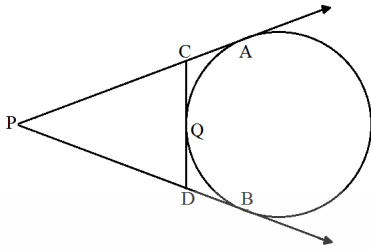
14. Fill in the blanks:
The common point of a tangent and the circle is called

Section B

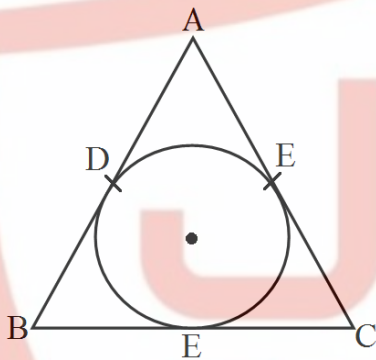
* **Given section consists of questions of 2 marks each. [10]**

1.

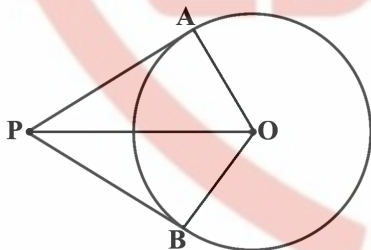
In the figure, PA and PB are tangents to the circle drawn from an external point P. CD is a third tangent touching the circle at Q. If PB = 10cm and CQ = 2cm, what is the length PC?



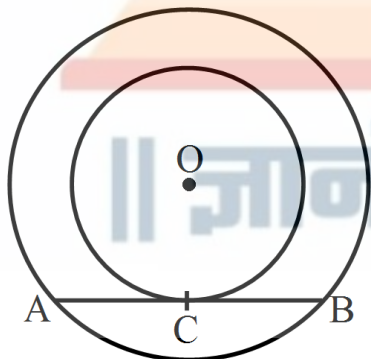
2. What is the distance between two parallel tangents of a circle of radius 4cm?
3. In the given figure, a circle inscribed in a triangle ABC, touches the sides AB, BC and AC at points D, E and F respectively. If AB = 12cm, BC = 8cm and AC = 10cm, find the lengths of AD, BE and CF.



4. In the given figure, PA and PB are the tangent segments to a circle with centre O. Show that the points A, O, B and P are concyclic.



5. In the given figure, the chord AB of the larger of the two concentric circles, with centre O, touches the smaller circle at C. Prove that AC = CB.



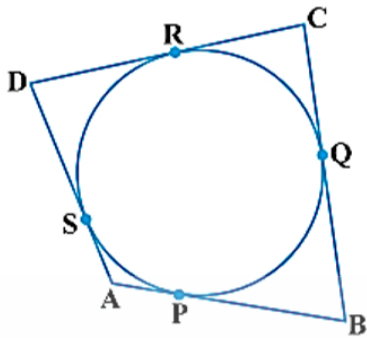
Section C

* Given section consists of questions of 3 marks each.

[12]

1.

A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$



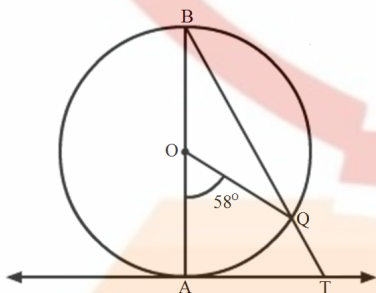
2. A man sitting at a height of 20m on a tall tree on a small island in the middle of a river observes two poles directly opposite to each other on the two banks of the river and in line with the foot of tree. If the angles of depression of the feet of the poles from a point at which the man is sitting on the tree on either side of the river are 60° and 30° respectively. Find the width of the river.
3. A tree breaks due to the storm and the broken part bends so that the top of the tree touches the ground making an angle of 30° with the ground. The distance from the foot of the tree to the point where the top touches the ground is 10 metres. Find the height of the tree.
4. A vertically straight tree, 15m high, is broken by the wind in such a way that its top just touches the ground and makes an angle of 60° with the ground. At what height from the ground did the tree break?

Section D

* Given section consists of questions of 5 marks each.

[10]

1. In the given figure, AB is a diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 58^\circ$, find $\angle ATQ$.



2. Two tangent segments PA and PB are drawn to a circle with centre O such that $\angle APB = 120^\circ$. Prove that $OP = 2 AP$.

Section E

* Case study based questions

[4]

1. Two ships are there in the sea on either side of a light house in such a way that the ships and the light house are in the same straight line. The angles of depression of two ships are observed from the top of the light house are 60° and 45° respectively. If the height of the light house is 200m, find the distance between the two ships.

(Use $\sqrt{3} = 1.73$)



॥ ज्ञानं एव श्रमस्य पुंजः ॥