



MATHS

NCERT - NCERT MATHEMATICS (Bengali)

TANGENTS AND SECANTS TO A CIRCLE

Example

1. Find the length of the tanget to a circle with centre 'O' and radius = 6cm from a point P



2. Draw a pair of tangents to a circle of radius 5cm which are inclined to each other at an angle 60° .

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3. Draw a circle with radius 4.2cm and draw a tangent at one side of the diameter .



5. Construct a tangent to a circle of radius

4.1cm at any point .



- 1. Fill in the blanks
- (i) A tangent to a circle touches it in Point(s).

(ii) A line intersecting a circle in two points is called a

(iii) Number of tangents can be drawn to a circle parallel to the given tangent is(iv) The common point of a Tangent to a circle and the circle is called

(v) We can draw tangents to a given circle.

(vi) A circle can have parallel tangents at

the most.



2. Fill in the blanks

A tangent PQ at a point P of a circle of radius 5cm meets a line through the centre O at a point Q so that OQ = 13cm. Find length of PQ.

3. Draw a circle with radius 3.3cm and draw a

tangent at one side of the diameter .



4. Fill in the blanks

Calculate the length of tangent from a point

15cm away from the centre of a circle of

radius 9cm.

5. Fill in the blanks

Prove that the tangents to a circle at the end

points of a diameter are parallel.

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Exercise 9 2

1. Choose the correct answer and give justification for each.

(i) The angle between a tangent to a circle and the radius at the point of contact is A. $60^{\,\circ}$

B. 30°

C. 45°

D. $90\,^\circ$

Answer: D

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2. Choose the correct answer and give justification for each.

(ii) From a point Q, the length of the tangent

to a circle is 24 cm. and the distance of Q from the centre is 25 cm. The radius of the circle is

A. 7*cm*

B. 12cm

 $\mathsf{C.}\,15cm$

D.24.5cm

Answer: A



3. Choose the correct answer and give justification for each.

If AP and AQ are the two tangents a circle with centre O so that $\angle POQ = 110^{\circ}$, then $\angle PAQ$

is equal to



A. 60°

B. 70°

C. 80°

D. 90°

Answer: B



4. Choose the correct answer and give justification for each.

If tangents PA and PB from a point P to a circle with centre O are inclined to each other at angle of 80° , then $\angle POA$ is equal to A. $50^{\,\circ}$

B. 60°

C. 70°

D. 80°

Answer: A

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5. Choose the correct answer and give justification for each. In the figure XY and X^1Y^1 are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X^1Y^1 at B then





A. 80°

B. 100°

C. 90°

D. 60°

Answer: C



6. Two concentric circles of radii 5cm and 3cm

are drawn. Find the length of the chord of the

larger circle which touches the smaller circle.



7. Prove that the parallelogram circumscibing

a circle is a rhombus.

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8. A triangle ABC is drawn to circumscribe a circle of radius 3cm such that the segments BD and DC into which BC is divided by the point of contact D are of length 9cm. And 3cm. Respectively (See adjacent figure). Find the

sides AB and AC.





9. Draw a circle of radius 6cm. From a point 10cm away its centre, construct the pair of tangents to the circle .





10. Construct a tangent to a circle of radius

4cm at any point .



11. Draw a circle with the help of a compass. Take a point outside the circle. Construct the pair of tangents from this point to the circle .



12. In a right triangle ABC, a circle with a side. AB as diameter is drawn to intersect the hypotenuse AC in P. Prove that the tangent to the circle at P bisects the side BC.

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13. Draw a circle with radius 4cm and draw a

tangent at any point on the circle.

1. Fill the blank: Atmost _____ tangent can

drawn from any point on the circle.

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2. In a circle of radius 12cm , a chord subtends an angle of 120° at the centre. Find the area of the corresponding minor segment of the circle (use $\pi=3.14$ and $\sqrt{3}=1.732$)

3. A car has two wipers which do not ovarlap. Each wiper has a blade of length 25cm sweeping through an angle of 115° . Find the total area cleaned at each sweep of the blades.

$$\left(use\pi=rac{22}{7}
ight)$$

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4. Find the area of the shaded region in the adjacent figure, where ABCD is a square of side

10cm and semicircles are drawn with each side

of the square as diameter $(use\pi=3.14)$





5. Find the area of the shaded region in figure,

if ABCD is a square of side 7cm . And APD and



6. In the figure, OACB is a quadrant of a circle with centre O and radius 3.5cm . If OD = 2cm, find the area of the shaded





7. AB and CD are respectively arcs to two concentric circles of radii 21cm and 7cm with centre O (See figure), If $\angle AOB = 30^{\circ}$, find



$$(use\pi = 3.14)$$





Optional Exercise

1. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line - segment joining the

points of contact at the centre.



2. PQ is a chord of length 8cm of a circle of

radius 5cm. The tangents at P and Q intersect

at a point T (See figure). Find the length of TP.





3. Draw a circle with radius 2.8cm and draw a

tangent at any point on the circle.



4. Construct a tangent to a circle of radius

3.7cm at any point .

5. Draw a circle with radius 2 cm in length. Take point apart from the centre 5 cm in length. Draw One tangent to the circle from this external point.

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6. Find the area of the shaded region in the figure, in which two circles with centres A andB touch each other at the point C, where

AC = 8cm and AB = 3cm



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7.

ABCD is a rectangle with AB=14cm and

BC = 7cm. Taking DC, BC and AD as diameters, three semicircles are drawn as shown in the figure. Find the area of shaded region.



What We Have Discussed

1. A Tangent to a circle is a line which touches

the circle at only one point.

2. Show that , The tangent at any point of a circle is perpendicular to the radius through the point of contact.

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3. The lengths of the two tangents from an

external point to a circle are equal.



4. Draw a circle with radius 2.2 and draw a

tangent at one side of the diameter.



5. Draw a circle with radius 2.6 and draw a

tangent at one side of the diameter.

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6. Area of segment of a circle = Area of the corresponding sector- Area of the



2. How many tangents can you draw to a circle

from a point away from it ?



3. In the adjacent figure, which lines are

tangents to the circle ?





4. Draw a circle with radius 3.1cm and draw a

tangent at any point on the circle .



What shapes can they be broken into, of which

we can find area easily ?

Make some more pictures and think of the

shapes they can be divided into different

parts.



6. Find the area of sector, whose radius is 7 cm.

with the given angle :

i. 60° ii. 30° iii. 72° iv. 90° v. 120°



7. The length of the minute hand of a clock is

 $14 \mathrm{~cm}$. Find the area swept by the minute hand

in 10 minutes.





1. Draw a circle with radius 3.5cm and draw a

tangent at any point on the circle.

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2. Draw a circle with radius 3 cm in length. Take point apart from the centre 7 cm in length. Draw One tangent to the circle from this external point.





4. Draw a circle with radius 2.5cm and draw a

tangent at any point on the circle.

5. How can you find the area of a major segment using area of the corresponding minor segment ?