# ©'doubtnut 

India's Number 1 Education App

## MATHS

# BOOKS - S CHAND IIT JEE FOUNDATION 

## CIRCLES

Solved Examples

1. In the given circle with diameter $A B$ find the value of $x$.

(D) Watch Video Solution
2. $O$ is the centre of the circle. Find the values of $p, q$ and $r$.


## - Watch Video Solution

3. If the length of a chord of a circle is equal to its radius, then find the angle subtended by it at the minor arc of the circle.

## - Watch Video Solution

4. PQ is the diameter of the given circle, whose centre is O . Given, $\angle R o s=54^{\circ}$, calculate $\angle R T S$.


## - Watch Video Solution

5. The length of the common chord of two circles of radii 15 and 20 , whose centres are 25 units apart, is

## - Watch Video Solution

6. If $O$ is the centre of the given circle and $B C=A O$, then which of the following statements is true ?
A. $2 x=y$
B. $x=3 y$
C. $3 y=y$
D. $x=2 y$

## Answer: B

## - Watch Video Solution

## Question Bank

1. If the two circles $C_{1}$ and $C_{2}$ have three points in common, then which of the following is correct ?
A. $C_{1}$ and $C_{2}$ are concentric
B. $C_{1}$ and $C_{2}$ are the same circle
C. $C_{1}$ and $C_{2}$ have different centres
D. None of the above

## Answer: B

## - Watch Video Solution

2. Which of the following pairs of lines can be parallel ?
3. Two tangents to a circle.
4. Two diameters of a circle.
5. A chord of circle and a tangent to a tangent to a circle.
6. Two chords of a circle.

Select the correct answer using the codes given below :
A. 1, 2 and 3
B. 2, 3 and 4
C. 1, 3 and 4
D. 1, 2 and 4

## Answer: C

## Watch Video Solution

3. Three circles with equal radii touch each other externally. The figure formed by joining the centres of these circles is
A. an isosceles triangle
B. an equilateral triangle
C. a scalene triangle
D. a right angled triangle

## Answer: B

4. Two non-intersecting circles one lying inside another arc of diameters $a$ and $b$. The minimum distance between their circumferences is $c$. The distance between their centres is
A. $a-b-c$
B. $a+b-c$
C. $\frac{1}{2}(a-b-c)$
D. $\frac{1}{2}(a-b)-c$

## Answer: D

## - Watch Video Solution

5. In the given figure, if $A B$ is the diameter of the circle and $P M$ the internal bisector of $\angle A P B$, then the measure of angle ABM is

A. $15^{\circ}$
B. $30^{\circ}$
C. $45^{\circ}$
D. $60^{\circ}$

Answer: C

- Watch Video Solution

6. A square is inscribed in a circle with centre 0 . What angle does each side subtend at the centre O ?

A. $45^{\circ}$
B. $60^{\circ}$
C. $75^{\circ}$
D. $90^{\circ}$

Answer: D
7. A regular polygon is inscribed in a circle. If a side subtends an angle of $45^{\circ}$ at the centre. What is the number of sides of the polygon ?
A. 6
B. 5
C. 10
D. 8

## Answer: D

## - Watch Video Solution

8. The length of a chord of a circle at a distance of 5 cm from the centre is 24 cm . The diameter of the circle is
A. 26 cm
B. 24 cm
C. 13 cm
D. 12 cm

## Answer: A

## - Watch Video Solution

9. In a circle of radius 25 cm , a chord is drawn at a distance of 7 cm from the centre. Find the length of the chord.
A. 24 cm
B. 48 cm
C. 50 cm
D. 36 cm

## Answer: B

10. A chord 6 cm long is at a distance of 4 cm from the centre of a circle.

Find the length of a chord which is at a distance of 3 cm from the centre of the circle.
A. 10 cm
B. 6 cm
C. 8 cm
D. 12 cm

## Answer: C

## - Watch Video Solution

11. In the given figure, $\triangle A B C$ is inscribed in a circle and the bisector of $\angle A$ meets BC in D and the circle in E . If $\angle E C D=30^{\circ}$, what is $\angle A$ ?

A. $60^{\circ}$
B. $45^{\circ}$
C. $70^{\circ}$
D. $150^{\circ}$

Answer: A

- Watch Video Solution

12. 

0
$\angle A O B=90^{\circ}$ and $\angle B O C=120^{\circ} . \angle A B C$ is equal to

A. $150^{\circ}$
B. $210^{\circ}$
C. $75^{\circ}$
D. $105^{\circ}$

Answer: C
13. In the given figure, $O$ is the centre of the circle. The value of $x$ is

A. $75^{\circ}$
B. $55^{\circ}$
C. $125^{\circ}$
D. $110^{\circ}$

## Answer: C

14. PQRs is a cyclic quadrilateral. Find the measure of $\angle P$ and $\angle Q$.

A. $135^{\circ}, 60^{\circ}$
B. $60^{\circ}, 120^{\circ}$
C. $60^{\circ}, 90^{\circ}$
D. $100^{\circ}, 120^{\circ}$

Answer: A

## D Watch Video Solution

15. If $\angle A B O=35^{\circ}$ and $\angle A C O=20^{\circ}$, then $\angle x$ is

A. $55^{\circ}$
B. $110^{\circ}$
C. $80^{\circ}$
D. $70^{\circ}$

## Answer: B

## - Watch Video Solution

16. $A B C$ is an isosceles triangle in the given circle with centre 0 . $\angle A B C=42^{\circ}, \angle C D E$ is equal to

A. $84^{\circ}$
B. $138^{\circ}$
C. $96^{\circ}$
D. $148^{\circ}$

## Answer: C

## - Watch Video Solution

17. In the given figure, $A C$ is the diameter of the circle with centre 0 .

Chord BD is perpendicular to $A C$. Express $p$ in terms of $x$.

A. $x / 2$
B. $90^{\circ}+x / 2$
C. $90^{\circ}-x / 2$
D. $180^{\circ}-x$

## Answer: C

## - Watch Video Solution

18. In the given figure, $A E$ is the diameter of the circle. Write down the numerical value of $\angle A B C+\angle C D E$.

A. $360^{\circ}$
B. $540^{\circ}$
C. $180^{\circ}$
D. $270^{\circ}$

## Answer: D

- Watch Video Solution

19. In the given figure, $\angle P A Q=59^{\circ}, \angle A P D=40^{\circ}$, then what is $\angle A Q B$ ?

A. $19^{\circ}$
B. $20^{\circ}$
C. $22^{\circ}$
D. $27^{\circ}$

## Answer: C

20. 

$\angle C A B=80^{\circ}, \angle C B A=55^{\circ}$ and $\angle D C A=45^{\circ}$. The statement BD is the diameter is :

A. False
B. cannot be determined
C. True
D. Not possible

## Answer: C

## - Watch Video Solution

21. In the given figure, $C$ and $D$ are points on a semi circle described on AB as diameter. $\angle A B D=75^{\circ}$ and $\angle D A C=35^{\circ}$. What is $\angle B D C$ ?

A. $130^{\circ}$
B. $110^{\circ}$
C. $90^{\circ}$
D. $100^{\circ}$
22. In the adjoining figure, chord ED is parallel to the diameter of the circle. If $\angle C B E=65^{\circ}$, then what is the value of $\angle D E C$ ?

A. $35^{\circ}$
B. $55^{\circ}$
C. $45^{\circ}$
D. $25^{\circ}$

## D Watch Video Solution

23. $A B$ and $B C$ are two equal chords of a circle with centre $O$. $O M \perp A B$ and $O N \perp B C$. OB is joined. State if each of the following statements is true or false. Give reasons in each case.

(i) $\mathrm{OM}=\mathrm{ON}$
(ii) $\triangle O M B \cong \triangle O N B$
(iii) BO bisects $\angle A B C$
24. In the given figure, find $\mathrm{x}+\mathrm{y}$.

A. $116^{\circ}$
B. $102^{\circ}$
C. $64^{\circ}$
D. $76^{\circ}$

Answer: B
25. In the given figure, $O$ is the centre of the circle. $A B D$ is a straight line and $\angle C B D=65^{\circ}$. Find reflex $\angle A O C$ (marked $x^{\circ}$ ).

A. $130^{\circ}$
B. $230^{\circ}$
C. $190^{\circ}$
D. $65^{\circ}$

## Self Assessment Sheet

1. Which of the following statements is not TRUE ?

A. The diameter is the greatest chord that can be drawn in a circle.
B. A straight line cannot intersect a circle in more than two points.
C. A diameter bisects a circle.
D. In the figure $\angle A=\angle C$ and $\angle B=\angle D$

## D Watch Video Solution

2. O is the centre of the circle, ABN is a straight line. Find $\angle A O C$.

A. $128^{\circ}$
B. $132^{\circ}$
C. $130^{\circ}$
D. $135^{\circ}$

## Answer: C

## D Watch Video Solution

3. Find the size of the angle marked $x$.

A. $60^{\circ}$
B. $65^{\circ}$
C. $70^{\circ}$
D. $55^{\circ}$

## Answer: B

## D Watch Video Solution

4. The length of a chord of a circle of radius 10 cm is 12 cm . Find the distance of the chord from the centre of the circle.
A. 6 cm
B. 5 cm
C. 8 cm
D. 7 cm

## Answer: C

## - Watch Video Solution

5. Chord ED\|||diameter AC. Determine $\angle C E D$.

A. $50^{\circ}$
B. $45^{\circ}$
C. $55^{\circ}$
D. $40^{\circ}$

Answer: D

Watch Video Solution
6. The measure of the line segment joining the centre of a circle to the mid-point of a chord is :
A. twice the measure of the chord
B. half the measure of the chord
C. equal to the measure of the chord
D. None of the above

## Answer: D

## - Watch Video Solution

7. $A B C D$ is a cyclic quadrilateral whose side $A B$ is a diameter of the circle through $\mathrm{A}, \mathrm{B}, \mathrm{C}, \mathrm{D}$. If $\angle A D C=130^{\circ}$, find $\angle B A C$.

A. $40^{\circ}$
B. $50^{\circ}$
C. $60^{\circ}$
D. $30^{\circ}$

Answer: A

- Watch Video Solution

8. $O$ is the centre of the circle APQB, AOBR, PQR are straight lines. Find $x$ in terms of y and z .

A. $x=y+z$
B. $x=2 y+z$
C. $x=y+2 z$
D. $x=2(y+z)$

## Answer: D

## - Watch Video Solution

9. $O$ is the centre of the circle $A B C$, radius $5 \mathrm{~cm}, A B=8 \mathrm{~cm}, A C=6 \mathrm{~cm}$.

Calculate the lengths of the perpendiculars $\mathrm{OP}, \mathrm{OQ}$ from O to $\mathrm{AB}, \mathrm{AC}$.

A. $3 \mathrm{~cm}, 4 \mathrm{~cm}$
B. $4 \mathrm{~cm}, 3 \mathrm{~cm}$
C. $2 \mathrm{~cm}, 3 \mathrm{~cm}$
D. $3.5 \mathrm{~cm}, 2.5 \mathrm{~cm}$

## Answer: A

10. $\mathrm{AB}, \mathrm{AC}$ are equal chords of the circle ABCD . Calculate $\angle B A D$.

A. $100^{\circ}$
B. $94^{\circ}$
C. $96^{\circ}$
D. $80^{\circ}$

## Unit Test

1. Which of the following is equidistant from the vertices of a triangle ?
A. circumcentre
B. centroid
C. orthocentre
D. incentre

## Answer: A

## - Watch Video Solution

2. The circumcentre in a right triangle is :
A. inside the triangle
B. outside the triangle
C. on one of the perpendicular sides
D. on the hypotenuse

## Answer: D

## - Watch Video Solution

3. $P$ is the incentre of $\Delta A B C$. Which of the following statements is true?

A. $A Z=B Z$
B. $A Y=B X$
C. $P Y=P Z$
D. $P A=P C$

## Answer: C

## D View Text Solution

4. The incentre of a triangle coincides with the circumcentre, orthocentre and centroid in case of :
A. an isosceles triangle
B. an equilateral triangle
C. a right - angled triangle
D. a right - angled isosceles triangle

## Answer: B

5. Find $x$

A. $78^{\circ}$
B. $80^{\circ}$
C. $75^{\circ}$
D. $79^{\circ}$

Answer: D

## - Watch Video Solution

6. Calculate the size of angle $p$.

A. $20^{\circ}$
B. $30^{\circ}$
C. $40^{\circ}$
D. $25^{\circ}$

Answer: B
7. Calculate the size of the labelled angles

A. $a=27.5^{\circ}, b=27.5^{\circ}, c=55^{\circ}, d=27.5^{\circ}, e=97.5^{\circ}$
B. $a=28^{\circ}, b=27^{\circ}, c=60^{\circ}, d=28^{\circ}, e=102^{\circ}$
C. $a=30^{\circ}, b=25^{\circ}, c=55^{\circ}, d=30^{\circ}, e=95^{\circ}$
D. None of these

Answer: A

## - Watch Video Solution

8. Find pairs of parallel lines

A. AR, BX, AP, BY
B. $A Q, B Z, A P, B X$
C. $A Q, B Y, A P, B Z$
D. $A Q, B X, A R, B Z$

Answer: C

- Watch Video Solution

9. In the figure, $\mathrm{AB} \| \mathrm{CD}$ then

A. $p+r=q+s$
B. $p-r=q-s$
C. $p+s=q+r$
D. $p-q=s-r$

## Answer: B

## - Watch Video Solution

10. How many sides does a polygon have if the sum of its interior angles
is 30 right angles ?
A. 15
B. 17
C. 19
D. 20

## Answer: B

## D Watch Video Solution

11. Find $x$

A. $110^{\circ}$
B. $104^{\circ}$
C. $108^{\circ}$
D. $106^{\circ}$

## Answer: D

## - View Text Solution

12. Tick against the correct alternative.

The orthocentre of a triangle is the point of concurrency of its.
A. medians
B. angle bisectors
C. perpendicular bisectors of sides
D. altidues drawn to sides from opposite vertices.

## Answer: D

## - Watch Video Solution

13. Match correctly
(a) centroid
(1) medians of a $\Delta$
(b) incentre
(2) centre of the circumcircle point of intersection of the perp. bisectors of the sides of a $\Delta$
(c) Circumcentre
(3) point of intersection of the medians of a $\Delta$
(d) concurrent
(4) centre of the incircle point of intersection of the angle bisectors of a $\Delta$

## - Watch Video Solution

14. The lengths of the sides of a $\Delta \mathrm{ABC}$ are given below. In which of these cases are angles of the triangle in the increasing order of magnitude as $\angle C, \angle B, \angle A$.
A. $\mathrm{BC}=5 \mathrm{~cm}, \mathrm{CA}=6.5 \mathrm{~cm}, \mathrm{AB}=7.9 \mathrm{~cm}$
B. $\mathrm{BC}=10 \mathrm{~cm}, \mathrm{CA}=6.9 \mathrm{~cm}, \mathrm{AB}=5.4 \mathrm{~cm}$
C. $B C=3 \mathrm{~cm}, \mathrm{CA}=4 \mathrm{~cm}, \mathrm{AB}=5 \mathrm{~cm}$
D. $\mathrm{BC}=3.5 \mathrm{~cm}, \mathrm{CA}=3 \mathrm{~cm}, \mathrm{AB}=4 \mathrm{~cm}$

## - Watch Video Solution

15. $A B C D$ is a rhombus and $\operatorname{AED}$ is an equilateral triangle. $E$ and $C$ lie on opposite sides of $A D$. If $\angle A B C=78^{\circ}$, calculate $\angle D C E$.

A. $20^{\circ}$
B. $21^{\circ}$
C. $22^{\circ}$
D. $19^{\circ}$

## Answer: B

## - Watch Video Solution

16. Solve the system of linear equations for $x$ and $y$ :
$x+y=15$
$3 x-2 y=-5$
A. 6,12
B. 8,16
C. 5,10
D. 7,14

## Answer: C

## - Watch Video Solution

17. A regular polygon is inscribed in a circle. If a side subtends an angle of $30^{\circ}$ at the centre, what is the number of its sides?
A. 10
B. 8
C. 6
D. 12

## Answer: D

## - Watch Video Solution

18. Answer True or False. ACB is an arc of a circle with centre $O$ and
$\angle A B C=45^{\circ}$, then, $A O \perp O C$.


## - View Text Solution

19. Consider the following statements
20. The bisectors of all the four angles of a parallelogram enclose a rectangle.
21. The figure formed by joining the midpoints of the adjacent sides of a rectangle is a rhombus.
22. The figure formed by joining the midpoints of the adjacent sides of a
rhombus is a square.

Which of these statements are correct ?
A. 1 and 2
B. 2 and 3
C. 3 and 1
D. 1, 2 and 3

## Answer: A

## - Watch Video Solution

20. If the sum of the diagonals of a rhombus is 12 cm , and its perimeter is $8 \sqrt{5} \mathrm{~cm}$, then the lengths of the diagonals are :
A. 6 cm and 6 cm
B. 7 cm and 5 cm
C. 8 cm and 4 cm
D. 9 cm and 3 cm

## Answer: C

Watch Video Solution

