QB365

Important Questions - Circles

9th Standard CBSE

Mathematics

Reg.No. : | | | | | | |

Time : 01:00:00 Hrs

Total Marks : 50

Section-A

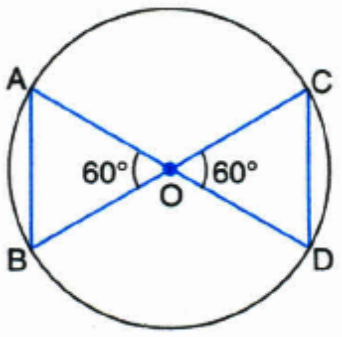
1) The path traced by the tip of the second's hand is a **1**

(a) circle (b) square (c) rectangle (d) straight line

2) The wheels of a vehicle are in **1**

(a) rectangular (b) triangular (c) circular shape (d) trapezoidal

3) In the figure, $\angle AOB = \angle COD = 60^\circ$, chord CD = 4 cm and 0 is the centre of the circle. Length of chord AB will be: **1**



(a) 4 cm (b) 8 cm (c) 2 cm (d) 6 cm.

4) The perpendicular from the centre of a circle bisects the: **1**

(a) circle (b) circumference (c) chord (d) radius.

5) The length of the chord of a circle, of radius 13 cm, at a distance of 5 cm from the centre is **1**

(a) 12 cm (b) 18 cm (c) 20 cm (d) 24 cm

6) The length of the perpendicular from the centre of a circle of radius 5 cm on a chord of it of length 8 cm is **1**

(a) 6 cm (b) 5 cm (c) 4 cm (d) 3 cm

7) AD is a diameter of a circle and AB is a chord. If AD = 34 cm and AB = 30 cm, the distance of AB from the centre of the circle is: **1**

(a) 17 cm (b) 15 cm (c) 4 cm (d) 8 cm

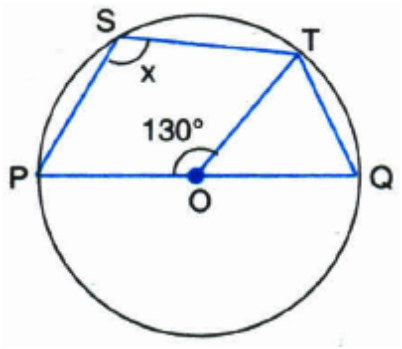
8) How many circles can pass through three given non-collinear points? **1**

(a) one and only one (b) two (c) three (d) infinitely many.

9) The length of a chord of a circle is equal to its radius. Find the measure of the angle subtended by that chord in major segment. **1**

(a) 30° (b) 60° (c) 45° (d) none of these.

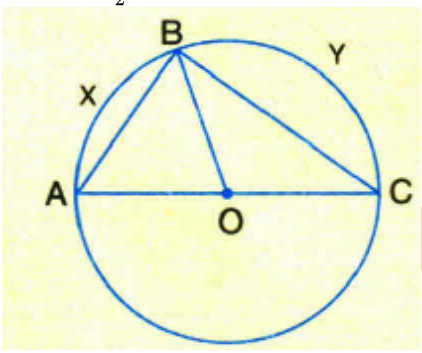
10) In the figure, O is the centre of the circle. Quadrilateral PQTS is a cyclic quadrilateral. If $\angle POT = 130^\circ$, then the measure of $\angle x$ is: **1**



(a) 50° (b) 65° (c) 115° (d) 130°

Section-B

11) In the figure, AOC is a diameter of the circle and arc AXB = $\frac{1}{2}$ arc BYC. Find $\angle BOC$. **2**

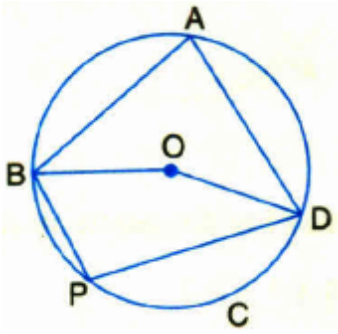


12) Find the length of a chord which is at a distance of 3 cm from the centre of a circle whose radius is 5 cm. **2**

13) Find the length of a chord of a circle which is at a distance of 4 cm from the centre of the circle with radius 5 cm. **2**

14) Two circles of radii 10 cm and 8 cm intersect and the length of the common chord is 12 cm. Find the distance between their centres. **2**

15) ABCD Is a cyclic quadrilateral. 0 is the centre of the circle. If $\angle BOD = 160^\circ$, find $\angle BPD$. **2**



16) PQRS is a cyclic quadrilateral, in which $\angle P = 2x^\circ$, $\angle Q = y^\circ$, $\angle R = 3x^\circ$ and $\angle S = 2y^\circ$. Find the values of x and y. **2**

17) In the adjoining figure is a circle with centre O. If $\angle BAC = 60^\circ$ and $\angle DCB = 100^\circ$, then find $\angle DBC$. **2**

18) Prove that if chords of congruent circles subtend equal angles at their centres, then the chords are equal. **2**

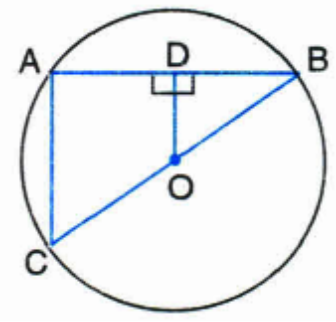
19) Suppose you are given a circle. Give a construction to find its centre. **2**

20) If two equal chords of a circle intersect within the circle, prove that the line joining the point of intersection to the centre makes equal angles with the chords. **2**

Section-C

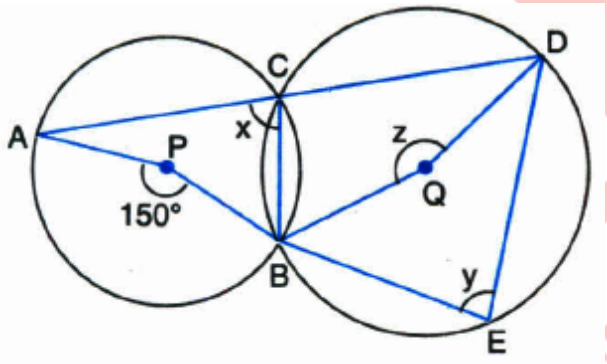
21) Two chords PQ and RS of a circle are parallel to each other and AB is the perpendicular bisector of PQ. Without using any construction, prove that AB bisects RS. **20**

22) OD is perpendicular to chord AB of a circle whose centre is O. If BC is a diameter, prove that CA = 20D. **20**



23) In figure, AB andAC are two equal chords of a circle whose centre is O. If OD ⊥ AB and OE ⊥ AC, prove that ADE is an isosceles triangle and ∠ABC=∠ACB **20**

24) P and Q are centres of the two circles which intersect at B and C. ACD is a straight line. Find the values of x, y, z. **20**



****

Section-A

1) (a) circle **1**

2) (c) circular shape **1**

3) (a) 4 cm **1**

4) (c) chord **1**

5) (d) 24 cm **1**

6) (d) 3 cm **1**

7) (d) 8 cm **1**

8) (a) one and only one **1**

9) (a) 30° **1**

10) (c) 115° **1**

Section-B

11) 120° **2**

12) 8 cm **2**

13) 6 cm **2**

14) $\left(8+2\sqrt{7}\right)cm$ **2**

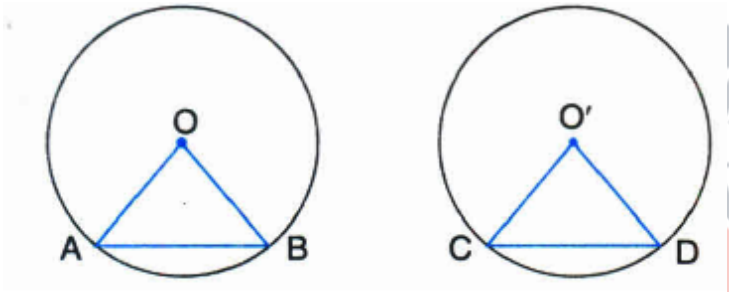
15) 100° **2**

16) 36, 60 **2**

17) 20° **2**

18) **2**

Given: $\angle AOB$ and $\angle CO'D$ are the two equal angles subtended by the chords AB and CD of two congruent circles with centres O and O' respectively.



To Prove: AB =CD.

Proof: In $\Delta \quad OAB$ and $\Delta \quad O'CD$

OA = O'C

| Radii of congruent circles OB = O'D | Radii of congruent circle

$\angle AOB = \angle CO'D$ | Given

$\therefore \Delta \quad OAB \cong \Delta \quad O'CD$ | SAS Rule

$\therefore$ AB = CD | CPCT

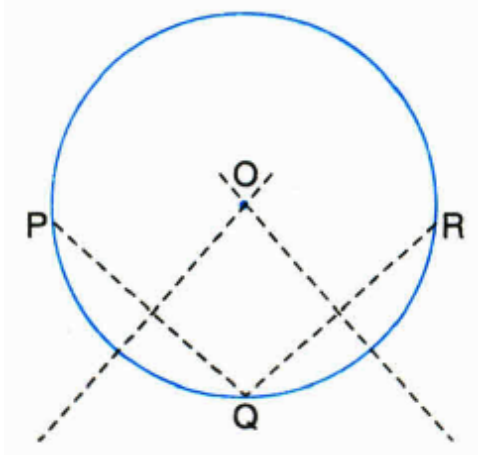
19) Steps of Construction: **2**

(i) Take any three points P, Q and R on the circle.

(ii) Join PQ and QR.

(iii) Draw the perpendicular bisectors of PQ and QR. Let these intersect at O.

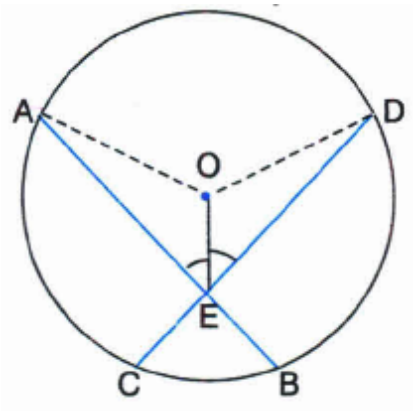
Then, O is the centre of the circle.



20) 2

Given: Two equal chords AB and CD of a circle with centre 0 intersect within the circle. Their point of intersection is E.

To Prove: $\angle OEA = \angle OED$.



Construction: Join OA and OD.

Proof: In ΔOEA and ΔOED ,

OE=OE I Common

OA=OD I Radii of a circle

AE=DE

| Proved in Example 2 above

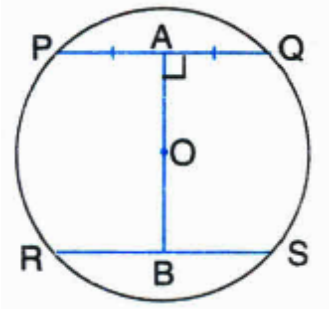
$\therefore$ $\Delta OEA \cong \Delta OED$ I SSS Rule

$\therefore$ $\angle OEA = \angle OED.$ I CPCT

Section-C

21) 20

Given: Two chords PQ and RS of a circle are parallel to each other and AB is the perpendicular bisector of PQ.



To Prove: AB bisects RS.

Proof: ∵ AB is the perpendicular bisector of PQ

∵ AB passes through the centre O.

|∵ The perpendicular bisector of a chord of a circle passes through the centre

∵ $PQ \parallel RS$

∵ AB⊥RS

∵ AB bisects RS.

| ∵ The perpendicular drawn from the centre of a circle bisects the chord

22) **Given:** OD is perpendicular to chord AB of a circle where centre is O. BC is a diameter of the circle. **20**

To Prove: CA=20D

Proof: OD⊥AB

∴ D is the mid-point of AB

|The perpendicular drawn from the centre of a circle to a chord bisects the chord.

In ΔBAC,

∵ $OD \parallel AC$ I By mid-point theorem

and $OD = \frac{1}{2}AC$

⇒ CA=2 OD

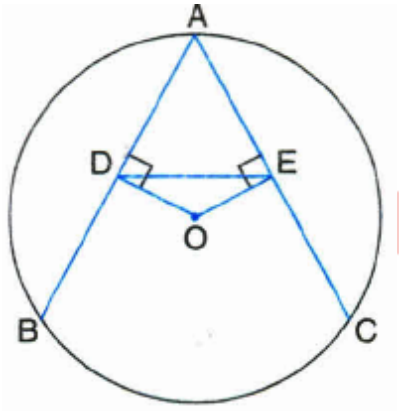
23) **Given:** In figure, AB and AC are two equal chords of a circle whose centre is O. OD⊥AB and OE⊥AC. **20**

To Prove: ADE is an isosceles triangle.

Proof: ∵ AB=AC

OD=OE

| Equal chords of a circle are equidistant from the centre of a circle



∴ In ΔODE,

$\angle ODE = \angle OED$

| Angle opposite to equal sides of a triangle are equal

⇒ $90^\circ - \angle ODE = 90^\circ - \angle OED$

⇒ $\angle ODA - \angle ODE = \angle OEA - \angle OED$

⇒ $\angle ADE = \angle AED$

∴ AD=AE

| Sides opposite to equal angles of a triangle are equal

∴ ΔADE is an isosceles triangle.

Also, OD = OE

∴ AB =AC

(chords equidistant from centre are equal)

∠ABC=∠ACB

24)

$2x = 150^\circ$

| The angle subtended by an arc of a circle at the centre is twice the angle subtended by it at any point on the remaining part of the circle

$\Rightarrow \quad x = 75^\circ$ ....(1)

$x + \angle BCD = 180^\circ$

| ∵ ACD is a straight line

$\Rightarrow \quad 75^\circ + \angle BCD = 180^\circ$

$\Rightarrow \quad \angle BCD = 105^\circ$

∵ BEDC is a cyclic quadrilateral

$\therefore \angle BCD + \angle BED = 180^\circ$

I Opposite angles of a cyclic quadrilateral are supplementary

$\Rightarrow \quad 105^\circ + y = 180^\circ$

$y = 75^\circ$ ....(2)

$z = 2y$

| The angle subtended by an arc of a circle at the centre is twice the angle subtended by it at any point on the remaining part of the circle

$\Rightarrow z = 2 \times 75^\circ = 150^\circ$ ...(3)