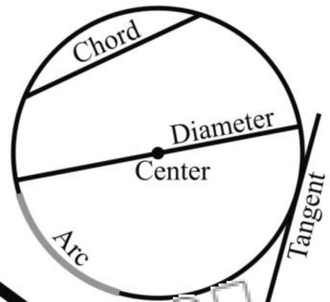

UNIT 9
CHORDS OF A CIRCLE

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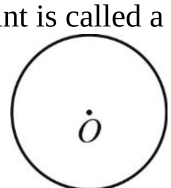
Circle **(K.B)**

(LHR 2014, GRW 2017, D.G.K 2014, 16)

"It is a set of points on a plane which are equidistant from a fixed point from a circle".

Or

Locus of a point in a plane equidistant from a fixed point is called a circle.

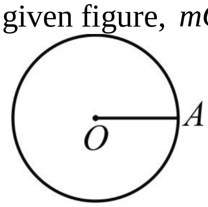


Centre of the Circle **(K.B)**

"The fixed point is called center of the circle". In the given figure, O is centre.

Radius of the Circle **(K.B)**

"The distance between the centre to any point of the circle is called radius of the circle". In the given figure, $m\overline{OA}$ is radius.



Radial Segment **(LHR 2015)** **(K.B)**

"A line segment which joins centre to any point of the circle is called radial segment". In the given figure, $\overline{OA}$ is radial segment.

Circumference **(K.B)**

(LHR 2014, 15, 16, GRW 2016, FSD 2015, SWL2016, D.G.K 2014)

"Boundary of the circle is called circumference".

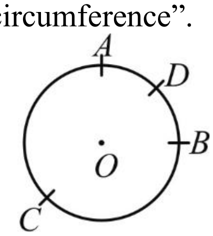
OR

"It is the length of the segment joining all the points of circle is called circumference". Circumference is measured by the formula $2\pi r$, where r is the radius.

Arc of a Circle **(K.B)**

(BWP 2014, RWP 2014, SGD 2015, D.G.K 2015)

"It is the part of circumference".



Major Arc **(K.B)**

(LHR 2016, FSD 2015, SWL 2016, RWP 2014)

"An arc which is greater than semi-circle is called major arc". In the given figure, ACB is major arc.

Minor Arc **(K.B)**

(LHR 2016, FSD 2015, SWL 2016, RWP 2014)

"An arc which is less than semi-circle is called minor arc". In the given figure, ADB is minor arc.

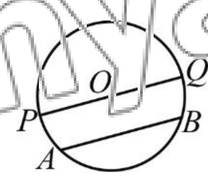
Chord of the Circle **(K.B)**

(LHR 2015, GRW 2014, MTN 2014)

"A line segment whose two end points are any two points of the circle".

OR

"A line segment which joins two points of the circle". In the given figure, $\overline{AB}$ and $\overline{PQ}$ are chords.



Diameter **(K.B)**

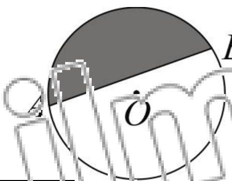
"A chord passing through centre of the circle is called diameter".

OR

"The largest chord is called diameter". In the given figure, $\overline{PQ}$ is diameter.

Segment of a Circle (K.B)

"A chord divides a circular region in two parts called segment of a circle". In the given figure, $\overline{AB}$ divides the circle into two segments.



Minor Segment (K.B)

(LHR 2016, FSD 2015, SWL 2016, RWP 2014)

"Circular region bounded by a chord and minor arc is called minor segment". In the given figure, shaded part is minor segment.

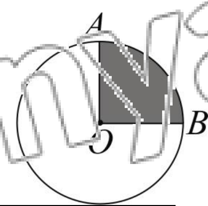
Major Segment (K.B)

"Circular region bounded by a chord and major arc is called major segment". In the given figure, non shaded part is major segment.

Sector of a Circle (K.B)

(LHR 2014, GRW 2014, 17, FSD 2014, SWL 2015, 16, D.G.K 2015)

"Circular region bounded by an arc and its two corresponding radial segments is called sector of a circle". In the given figure, AOB is a sector of the circle.



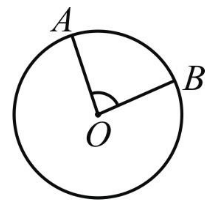
Central Angle of an Arc (K.B)

"An angle subtended by an arc at the center of the circle is called central angle".

Or

"An angle formed by two radial segments at the centre of the circle is called central angle".

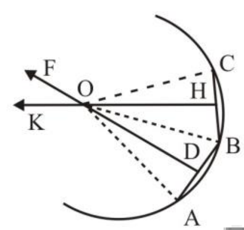
In the given figure, $\angle AOB$ is central angle of AB.



Theorem 1 (FSD 2015) (A.B)

Statement:

One and only one circle can pass through three non-collinear points.



Given:

A, B and C are three non collinear points in a plane.

To Prove:

One and only one circle can pass through three non-collinear points A, B and C.

Construction:

Join A with B and B with C.

Draw $\overline{DF}$ $\perp$ bisector to $\overline{AB}$ and $\overline{HK}$ $\perp$ bisector to $\overline{BC}$. So $\overline{DF}$ and $\overline{HK}$ are not parallel and they intersect each other at point O. Also join A, B and C with point O.

Proof:

Statements	Reasons
Every point on $\overline{DF}$ is equidistant from A and B. In particular $m\overline{OA} = m\overline{OB} \rightarrow (\text{i})$	$\overline{DF}$ $\perp$ bisector to $\overline{AB}$ (construction)
Similarly every point on $\overline{HK}$ is equidistant from B and C. In particular $m\overline{OB} = m\overline{OC} \rightarrow (\text{ii})$	$\overline{HK}$ is $\perp$ bisector to $\overline{BC}$ (construction)

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Now O is the only point common to $\overline{DF}$ and $\overline{HK}$ which is equidistant from A,B and C.	
i.e., $m\overline{OA}=m\overline{OB}=m\overline{OC}$	Using (i) and (ii)
However there is no such other point except O.	

Hence a circle with centre O and radius OA will pass through A, B and C.
Ultimately there is only one circle which passes through three given points A,B and C.

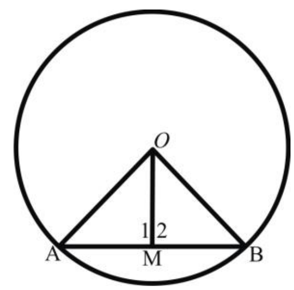
Theorem 2

(RWP 2015) **(A.B)**

Statement:

A straight line, draw from the centre of a circle to bisect a chord (which is not a diameter) is perpendicular to the chord.

Given:



M is the mid point of any chord $\overline{AB}$ of a circle with centre at O.

Where chord $\overline{AB}$ is not the diameter of the circle.

To Prove:

$\overline{OM}\perp$ the chord $\overline{AB}$.

Construction:

Join A and B with centre O. Write $\angle 1$ *and* $\angle 2$ as shown in the figure.

Proof:

Statements	Reasons
In $\Delta OAM \leftrightarrow \Delta OBM$	
$m\overline{OA}=m\overline{OB}$	Radii of the same circle
$m\overline{AM}=m\overline{BM}$	Given
$m\overline{OM}=m\overline{OM}$	Common
$\therefore \Delta OAM \cong \Delta OBM$	$S.S.S \cong S.S.S$
$\Rightarrow m\angle 1=m\angle 2 \rightarrow (i)$	Corresponding angles of congruent triangles
i.e., $m\angle 1+m\angle 2=m\angle AMB=180^\circ \rightarrow (\text{ii})$	Adjacent supplementary angles
$\therefore m\angle 1=m\angle 2=90^\circ$	From (i) and (ii)
i.e., $\overline{OM}\perp\overline{AB}$	

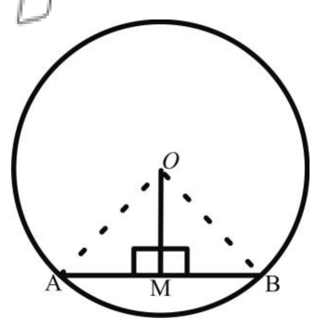
Theorem 3

(SWL 2015, D.G.K 2015) **(A.B)**

Statement:

Perpendicular from the centre of a circle on a chord bisects it.

Given:



$\overline{AB}$ is the chord of a circle with centre at O.

So that $\overline{OM}\perp$ chord $\overline{AB}$.

To Prove:

M is the mid point of chord $\overline{AB}$ *i.e.,* $m\overline{AM}=m\overline{BM}$

Construction:

Join A and B with centre O.

Proof:

Statements	Reasons
In $\angle rt\ \Delta^{s}\ OAM \leftrightarrow OBM$	
$m\angle OMA = m\angle OMB = 90°$	Given
$hyp.\ \overline{OA} = hyp.\overline{OB}.$	Radii of the same circle
$m\overline{OM} = m\overline{OM}$	Common
$\therefore \Delta OAM \cong \Delta OBM$	In $\angle rt\ \Delta^{s}\ \ H.S \cong H.S$
Hence, $m\overline{AM} = m\overline{BM}$	Corresponding sides of congruent triangles
$\Rightarrow \overline{OM}$ bisects the chord $\overline{AB}$.	

Corollary 1 **(K.B + U.B)**

$\perp$ Bisector of the chord of a circle passes through the centre of a circle.

Corollary 2 **(K.B + U.B)**

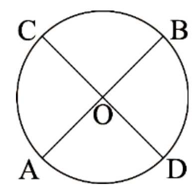
The diameter of a circle passes through the mid points of two parallel chords of a circle.

Exercise 9.1

Q. 1 Prove that, the diameters of a circle bisect each other. **(A.B)**

Given

In a circle with centre 'O', $\overline{AB}$ and $\overline{CD}$ are two diameters.



To prove

$\overline{AB}$ and $\overline{CD}$ bisect each other.

i.e O is midpoint of $\overline{AB}$ and $\overline{CD}$.

Proof

Statements	Reasons
$\overline{OA} \cong \overline{OB} \rightarrow (\text{i})$	Radii of same circle
AOB is a state line	
$\therefore O$ is midpoint of $\overline{AB} \rightarrow (\text{ii})$	
Similarly $\overline{OC} \cong \overline{OD}$	As in (i)
Or O is midpoint of $\overline{CD}$	
Hence $\overline{AB}$ and $\overline{CD}$ bisect each other.	From (ii) and (iii) each other

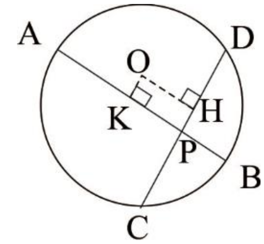
Q. 2 Two chords of a circle do not pass through the centre. Prove that they cannot bisect each other. **(A.B)**

Given

In a circle with centre 'O' chord $\overline{AB}$ and chord $\overline{CD}$ intersect each other at point P.

To prove

P is neither midpoint of $\overline{AB}$ nor $\overline{CD}$.



Construction

Draw $\overline{OK} \perp \overline{AB}$ and $\overline{OH} \perp \overline{CD}$.

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Proof

Statements	Reasons
$\overline{AK} \cong \overline{BK}$	The 9.2
$m\overline{AK} = m\overline{BK} = m\overline{KP} + m\overline{PB}$	$m\overline{KB} = m\overline{KP} + m\overline{PB}$
$\therefore$ P is not midpoint of $\overline{AB} \rightarrow (\text{i})$	
Similarly	
$\overline{CH} \cong \overline{HD}$	
Or $m\overline{CP} + m\overline{PH} = m\overline{HD}$	
$\therefore$ P is not midpoint of $\overline{CD} \rightarrow (\text{ii})$	
So $\overline{AB}$ and $\overline{CD}$ cannot bisect each other.	From (i) and (ii)

Q. 3 If length of the chord $\overline{AB} = 8cm$. Its distance from the centre is $3cm$, then find the diameter of such circle. **(GRW 2014, D.G.K 2014)** **(A.B)**

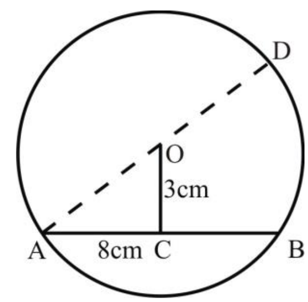
Solution:

From the fig, $m\angle OCA = 90°$

($\overline{OC} \perp \overline{AB}$, $\perp$ is shortest distance)

$m\overline{AC} = m\overline{BC} = 4cm,$

From Δ OCA,



$$\left(\overline{OA}\right)^2 = \left(\overline{AC}\right)^2 + \left(\overline{OC}\right)^2$$

$$= (4)^2 + (3)^2$$

$$= 16 + 9$$

$$= 25$$

Taking square root on both side

$$\sqrt{\left(\overline{OA}\right)^2} = \sqrt{25}$$

$$m\overline{OA} = \sqrt{25}$$

$$m\overline{OA} = 5cm$$

Since $\overline{OA}$ is the radius then diameter $= 2m\overline{OA}$

$= 2(5\text{cm})$

Result:

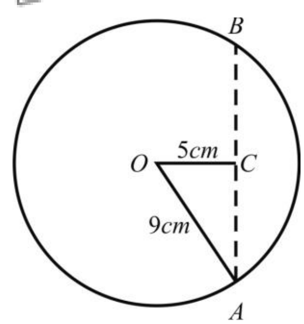
Diameter = 10cm

Q. 4 Calculate the length of a chord which stands at a distance $5cm$ from the centre of a circle whose radius is $9cm$. **(A.B)**

Solution:

Here $m\overline{OA} = 9cm$, $m\overline{OC} = 5cm$

From ΔAOC



$$\left(m\overline{AC}\right)^2 = \left(m\overline{OA}\right)^2 - \left(m\overline{OC}\right)^2$$

$$= (9)^2 - (5)^2 = 81 - 25$$

$$= 56$$

Taking square root on both sides

$m\overline{AC} = \sqrt{56}$

$= 2\sqrt{14}cm$

$m\overline{AB} = 2m\overline{AC}$ $\because$ C is midpoint of $\overline{AB}$, then by theorem 9.2

$= 2\left(2\sqrt{14}cm\right)$

$= 4\sqrt{14}cm$

Theorem 4 **(MTN 2015)** **(A.B)**

9.1(iv)

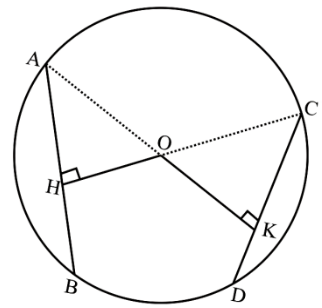
Statement:

If two chords of a circle are congruent then they will be equidistant from the centre.

Given:

$\overline{AB}$ and $\overline{CD}$ are two equal chords of a circle with centre at *O*.

So that $\overline{OH} \perp \overline{AB}$ and $\overline{OK} \perp \overline{CD}$.



To Prove:

$m\overline{OH} = m\overline{OK}$

Construction:

Join *O* with *A* and *O* with *C*. So that

We have $\angle rt\Delta^{S} OAH$ and OCK.

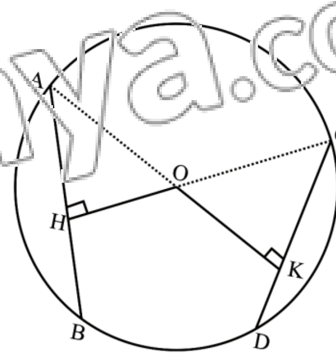
Proof:

Statements	Reasons
$\overline{OH}$ bisects chord $\overline{AB}$	$\overline{OH} \perp \overline{AB}$ Perpendicular from the centre of a circle on a chord bisects it.
i.e., $m\overline{AH} = \frac{1}{2}m\overline{AB}$ (i)	
Similarly $\overline{OK}$ bisects chord $\overline{CD}$	$\overline{OK} \perp \overline{CD}$ Perpendicular from the centre of a circle on a chord bisects it.
$i.e., m\overline{CK} = \frac{1}{2}m\overline{CD}$ (ii)	
But $m\overline{AB} = m\overline{CD}$ (iii)	Given
Hence $m\overline{AH} = m\overline{CK}$ (iv)	Using (i), (ii) & (iii)
Now in $\angle rt\Delta^{S} OAH \leftrightarrow OCK$	Given $\overline{OH} \perp \overline{AB}$ and $\overline{OK} \perp \overline{CD}$
$hyp\overline{OA} = hyp\overline{OC}$	Radii of the same circle
$m\overline{AH} = m\overline{CK}$	Already Proved in (iv)
$\therefore \Delta OAH \cong \Delta OCK$	*H.S* postulate
$\Rightarrow m\overline{OH} = m\overline{OK}$	Corresponding side of congruent triangles

Theorem 5 **(A.B)**

9.1(v)

Two chords of a circle which are equidistant from the centre, are congruent.



Given:

$\overline{AB}$ and $\overline{CD}$ are two chords of a circle with centre at O.
$\overline{OH} \perp \overline{AB}$ and $\overline{OK} \perp \overline{CD}$, so that $m\overline{OH} = m\overline{OK}$

To Prove:

$m\overline{AB} = m\overline{CD}$

Construction:

Join A and C with O. So that we can form $\angle rt\Delta^s OAH$ and OCK.

Proof:

Statements	Reasons
In $\angle rt\Delta^s OAH \Leftrightarrow OCK$.	
$\because$ hyp$\overline{OA}$ = hyp$\overline{OC}$	Radii of the same circle.
$m\overline{OH} = m\overline{OH}$	Given
$\therefore \Delta OAH \cong \Delta OCK$	$H.S$ Postulate
So $m\overline{AH} = m\overline{CK}$ (i)	Corresponding sides of congruent triangles
But $m\overline{AH} = \frac{1}{2} m\overline{AB}$ (ii)	$\overline{OH} \perp$ chord $\overline{AB}$ (Given)
Similarly $m\overline{CK} = \frac{1}{2} m\overline{CD}$ (iii)	$\overline{OK} \perp$ chord $\overline{CD}$ (Given)
Since $m\overline{AH} = m\overline{CK}$	Already proved in (i)
$\therefore \frac{1}{2} m\overline{AB} = \frac{1}{2} m\overline{CD}$	Using (ii) & (iii)
or $m\overline{AB} = m\overline{CD}$	Multiplying both sides by 2

Exercise 9.2

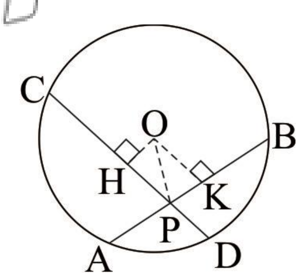
Q. 1 Two equal chords of a circle intersect, show that the segments of the one are equal corresponding to the segments of the other. **(A.B)**

Given

In a circle with centre 'O' $\overline{AB}$ and $\overline{CD}$ are two chords of the circle intersecting at P such that $m\overline{AB} = m\overline{CD}$

To prove

$m\overline{AP} = m\overline{DP}$ and $m\overline{BP} = m\overline{CP}$



Construction

Draw $\overline{OH} \perp \overline{CD}$ and $\overline{OK} \perp \overline{AB}$

Join O to P.

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Proof

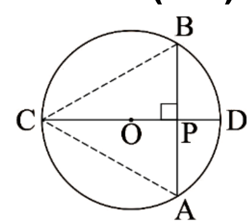
Statements	Reasons
$m\overline{OH} = m\overline{OK}$	Th-9. $\left(\overline{AB} \cong \overline{CD}\right)$
Also H is midpoint of $\overline{CD}$ and K is midpoint of $\overline{AB}$	
In rt $\Delta OPH \leftrightarrow \Delta$ rt OPK	
$\overline{OH} \cong \overline{OK}$	Proved
$\overline{OP} \cong \overline{OP}$	Common
$\therefore \Delta OPH \cong \Delta OPK$	S.A.S postulate
$\overline{HP} \cong \overline{KP} \rightarrow (\text{i})$	Corresponding sides of $\cong \Delta^s$
$m\overline{CP} = m\overline{CH} + m\overline{HP} \rightarrow (\text{ii})$	
$\overline{CH} \cong \overline{BK} \rightarrow (\text{ii})$	Both are half of congruent segments
$m\overline{CP} = m\overline{BK} + m\overline{KP}$ $= m\overline{BP}$ Similarly $m\overline{AP} = m\overline{DP}$	From (i),(ii) and (iii)

Q. 2 $\overline{AB}$ **is the chord of a circle and the diameter** $\overline{CD}$ **is perpendicular bisector of** AB**. Prove that** $m\overline{AC} = m\overline{BC}$**.** **(A.B)**

Given

In a circle with centre 'O', chord $\overline{AB}$ and diameter $\overline{CD}$ intersect each other at point 'P',

Such that $\overline{CD} \perp \overline{AB}$ and $\overline{AP} \cong \overline{BP}$



To prove

$\overline{AC} \cong \overline{BC}$

Construction

Join C to A and B

Proof

Statements	Reasons
In $\Delta ACP \leftrightarrow \Delta BCP$	
$m\overline{AP} = m\overline{BP}$	$\overline{OD} \perp \overline{AB}$ A straight line, draw from the centre of a circle to bisect a chord (which is not a diameter) is perpendicular to the chord.
$\angle APC \cong \angle BPC$	Both $= 90^\circ \left(\overline{CD} \perp \overline{AB}\right)$
$\overline{CP} \cong \overline{CP}$	Common
$\therefore \Delta ACP \cong \Delta BCP$	S.A.S postulate
$\overline{AC} \cong \overline{BC}$	Corresponding sides of $\cong \Delta^s$

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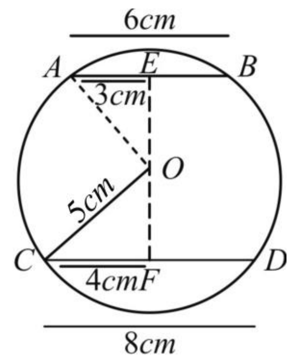
Q. 3 As shown in the figure, find the distance between two parallel chords $\overline{AB}$ and $\overline{CD}$. **(A.B)**

Solution:

Since $m\overline{OE} \perp \overline{AB}$ and $\overline{OF} \perp \overline{CD}$ then $\overline{AE} = 3cm$ and $\overline{CF} = 4cm$

From $\Delta\, OCF$,



$$\left(m\overline{OF}\right)^2 = \left(m\overline{OC}\right)^2 - \left(m\overline{CF}\right)^2$$

$$\left(m\overline{OF}\right)^2 = (5)^2 - (4)^2$$

$$\left(m\overline{OF}\right)^2 = 25 - 16$$

$$\left(m\overline{OF}\right)^2 = 9$$

$$\sqrt{\left(m\overline{OF}\right)^2} = \sqrt{9}$$

$$m\overline{OF} = 3$$

Similarly from $\Delta\, OAE$,

$$\left(m\overline{OE}\right)^2 = \left(m\overline{OA}\right)^2 - \left(m\overline{AE}\right)^2$$

$$\left(m\overline{OE}\right)^2 = (5)^2 - (3)^2$$

$$\left(m\overline{OE}\right)^2 = 25 - 9$$

$$\left(m\overline{OE}\right)^2 = 16$$

Taking sq. root

$$\sqrt{\left(m\overline{OE}\right)^2} = \sqrt{16}$$

$$m\overline{OE} = 4$$

Distance between parallel chords $\overline{AB}$ and $\overline{CD}$

$$m\overline{EF} = m\overline{OE} + m\overline{OF}$$
$$= 4cm + 3cm$$
$$= 7 \text{ cm}$$

Result:

Distance between parallel chords $\overline{AB}$ and $\overline{CD} = 7cm$.

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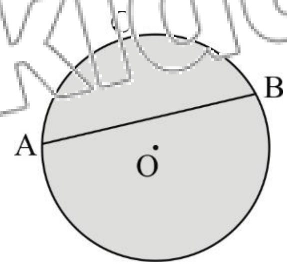
Miscellaneous Exercise 9

Q.1 Multiple choice questions

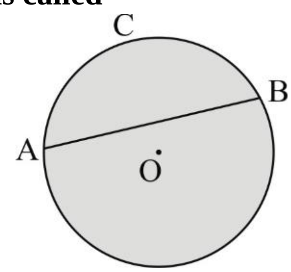
Four possible answers are given for the following question. Tick (✓) the correct answer.

(i) In the circular figure, *AB* is called **(K.B)**



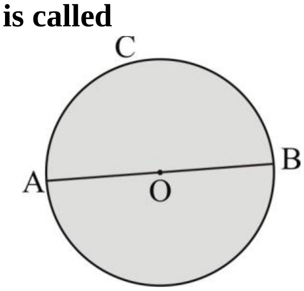
(a) An arc **(b)** A secant
(c) A chord **(d)** A diameter

(ii) In the circular figure, *ACB* is called **(K.B)**



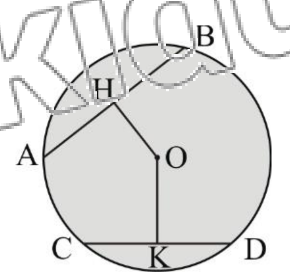
(a) An arc **(b)** A secant
(c) A chord **(d)** A diameter

(iii) In the circular figure, *AOB* is called **(SWL 2014)** **(K.B)**



(a) An arc **(b)** A secant
(c) A chord **(d)** A diameter

(iv) In a circular figure, two chords $\overline{AB}$ and $\overline{CD}$ are equidistant from the centre. They will be **(K.B)**



(a) Parallel **(b)** Non congruent
(c) Congruent **(d)** Perpendicular

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(v) **Radii of a circle are** **(LHR 2014, GRW 2014, SWL 2015, 16)** **(K.B)**

(a) All equal **(b)** Double of diameter
(c) All unequal **(d)** Half of any chord

(vi) **A chord passing through the centre of a circle is called** **(K.B)**
(LHR 2015, GRW 2014, FSD 2018)

(a) Radius **(b)** Diameter
(c) Circumference **(d)** Secant

(vii) **Right bisector of the chord of a circle always passes through the** **(K.B)**
(SWL 2014)

(a) Radius **(b)** Circumference
(c) Centre **(d)** Diameter

(viii) **The circular region bounded by two radii and the corresponding arc is called** **(K.B)**

(a) Circumference of a circle **(b)** Sector of a circle
(c) Diameter of a circle **(d)** Segment of a circle

(ix) **The distance of any point of the circle to its centre is called** **(K.B)**
(SGD 2014, D.G.K 2014)

(a) Radius **(b)** Diameter
(c) A chord **(d)** An arc

(x) **Line segment joining any point of the circle to the centre is called** **(K.B)**
(SGD 2014, ,MTN 1015, RWP 2015)

(a) Circumference **(b)** Diameter
(c) Radial segment **(d)** Perimeter

(xi) **Locus of a point in a plane equidistant from a fixed point is called** **(K.B)**
(D.G.K 2014)

(a) Radius **(b)** Circle
(c) Circumference **(d)** Diameter

(xii) **The symbol for a triangle is denoted by** **(K.B)**

(a) $\angle$ **(b)** Δ
(c) $\perp$ **(d)** □

(xiii) **A complete circle is divided into** **(K.B)**

(a) 90 degrees **(b)** 180 degrees
(c) 270 degrees **(d)** 360 degrees

(xiv) **Through how many non collinear points, a circle can pass?** **(K.B)**
(LHR 2015)

(a) One **(b)** Two
(c) Three **(d)** None

ANSWER KEY

i	c	iv	c	vii	c	x	c	xiii	d
ii	a	v	a	viii	b	xi	b	xiv	c
iii	d	vi	b	ix	a	xii	b		

Q.2 Differentiate between the following terms and illustrate them by diagrams.

(i) A circle and a circumference. **(K.B)**

Ans: **Differentiation**

Circle	Circumference
• Set of points which are equidistant from a fixed point is called circle	• Length of all points on the circle(boundary) which are equidistant from a fixed point is called circumference
• It is graphical figure	• It is a constant value

(ii) A chord and the diameter of a circle. **(K.B)**

Ans: **Differentiation**

Chord	Diameter
• A line segment whose two end points are any two points of the circle	• A chord passing through centre of the circle is called diameter
• It may/may not pass through centre of the circle	• It always passes through centre of circle
• It may/may not the longest line segment	• It is longest line segment inside the circle.

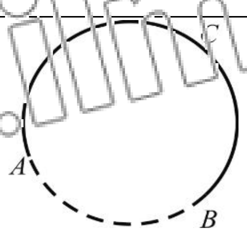
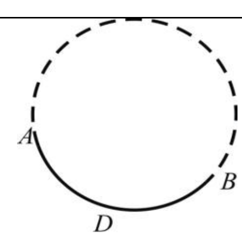
(iii) A chord and an arc of a circle. **(K.B)**

Ans: **Differentiation**

Chord	Arc
• A line segment whose two end points are any two points of the circle	• Any portion of circumference is called an arc
• It lies inside the circle	• It is part of circumference
• It is straight line	• It a curved shape

(iv) Minor arc and major arc of a circle. **(K.B)**

Ans: **Differentiation**

Major Arc	Minor Arc
• It is bigger than minor arc	• It is smallest then major arc
• Major arc is always greater than semicircle	• Major arc is always less than semi circle
 ACB is a major arc	 ADB is a minor arc

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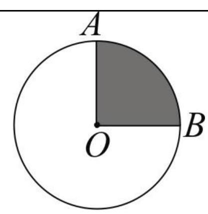
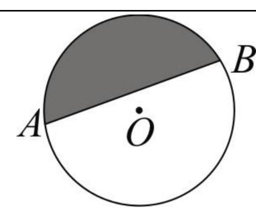
(v) Interior and exterior of a circle. **(K.B)**

Ans: **Differentiation**

Interior of the Circle	Exterior of the Circle
• All the points which lie inside of the circle form interior of the circle	• All the point which lie outside of the circle form exterior of the circle
• It includes the centre of the circle	• It does not include centre of the circle
• It is inner part of circle	• It is outer part of circle

(vi) A sector and a segment of a circle. **(K.B)**

Ans: **Differentiation**

Sector of Circle	Segment of Circle
• "Circular region bounded by an arc and its two corresponding radial segments is called sector of a circle". In the given figure, AOB is a sector of the circle.	• "A chord divides a circular region in two parts called segment of a circle". In the given figure, $\overline{AB}$ divides the circle into two segments.
• It does not include any chord	• It includes one chord
• It always included centre of the circle	• It may/may not include centre of the circle
	

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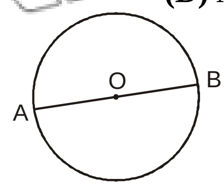
SELF TEST

Time: 40 min **Marks: 25**

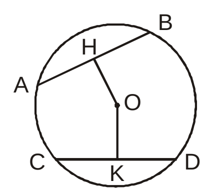
Q.1 Four possible answers (A), (B), (C) & (D) to each question are given, mark the correct answer. **(7×1=7)**

1 In the circular figure, ACB is called:
(A) An arc **(B)** A secant
(C) A chord **(D)** A diameter



2 Right bisector of the chord of a circle always passes through the:
(A) Radius **(B)** Circumference
(C) Centre **(D)** Diameter

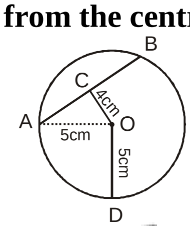
3 In a circular figure, two chords AB and CD are equidistant from the centre. They will be:



(A) Parallel **(B)** Non congruent
(C) Congruent **(D)** Perpendicular

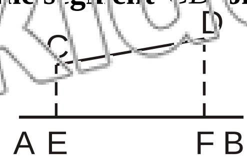
4 The union of a circle and its interior is called:
(A) Diameter **(B)** Chord
(C) Circular region **(D)** Circumference

5 In the adjacent circular figure with centre O and radius 5cm. The length of the chord intercepted at 4cm away from the centre of this circle is:



(A) 4cm **(B)** 6cm
(C) 7cm **(D)** 9cm

6 In figure the projection of a line segment $\overline{CD}$ on a line segment $\overline{AB}$ is the portion.



(A) $\overline{CE}$ **(B)** $\overline{DF}$
(C) $\overline{EF}$ **(D)** $\overline{AF}$

7 The triangle with sides 8cm, 15cm, 17cm is:
(A) Acute **(B)** Obtuse
(C) Right **(D)** Can't determine

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Q.2 Give Short Answers to following Questions. **(5×2=10)**

(i) Define circle.

(ii) What is the difference between minor segment and major segment?

(iii) Differentiate between interior and exterior of a circle and illustrate them by diagrams.

(iv) In a triangle ABC calculate $m\overline{BC}$ when $m\overline{AB}=6cm,\ m\overline{AC}=4cm, m\angle A=60^o$.

(v) In a triangle ABC, $m\overline{BC}=21cm,\ m\overline{AC}=17cm,\ m\overline{AB}=10cm$. Measure the length of projection of $\overline{AC}$ upon $\overline{BC}$.

Q.3 Prove that, **(8)**

A straight line, drawn from the centre of a circle to bisect a chord (Which is not a diameter) is perpendicular to the chord.

NOTE: Parents or guardians can conduct this test in their supervision in order to check the skill of students.

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