Questions

Geometry
General Exercise on Unit One

First: Complete the following

1) If one end of a line segment lies on the center of the circle and the other end on the circle, then this line segment is called .....
2) If the two ends of a line segment lie on the circle, then this line segment is called .....
3) The chord which passes through the center of the circle is called .....
4) The longest chord of the circle is called .....
5) The circle has ..... number of axes of symmetry.
6) In any circle the perpendicular straight line on any chord from its mid-point is ..... to the circle.
7) The circle divides the plane into ..... sets of points.
8) The perpendicular straight line on the diameter from one end is .....
9) The two tangents to a circle at the two end points of the diameter are .....
10) The equal chords in length of a circle are equidistant from .....
11) The chords of a circle are equidistant from its center are .....
12) If the point A lies outside the circle M of radius, then MA ..... R.
13) The line of centers of two intersecting circles is ..... , ...
14) If the surface of the circle M ∩ the surface of the circle N = φ , then the two circles M and N are.....
15) If the surface of the circle M ∩ the surface of the circle N = {A}, then the two circles M and N are .....
16) The number of circles can be drawn passing through two given points in the plane equals .....
17) If two circles have three common points, then they are .....
18) The radius of the smallest circle drawn to pass through two given points in the plane equals .....
19) The point of intersection of the symmetric axes of the sides of a triangle is .....
20) If M is a circle of radius r, A is apoint in the plane of the circle:
    (a) If MA = $\frac{1}{2}$ R, then A ..... the circle
    (b) If MA = R, then A ..... the circle
    (c) If MA = 3 R, then A ..... the circle

Second: Match from the column (X) to the column (Y) to get a true statement

Two circles of radii 8 cm. & 6 cm.

X	Y
1) If MN = 1 cm	a) M , N are two intersecting circles
2) If MN = 2 cm	b) M , N are two distant circles
3) If MN = 7 cm	c) M , N touching externally
4) If MN = 14 cm	d) M , N are two interior circles
5) If MN = 15 cm	e) M , N touching internally

Third : Choose the correct from the given ones :

1) If the length of a diameter of a circle is 7 cm, and the straight line L at distant 3.5 cm from its center, then L is .....

   a) Secant to the circle at two points b) Lies outside the circle.

   c) Tangent to the circle d) Axis of symmetry to the circle

2) If the point A belongs to the circle M of diameter 6 cm, then MA equals

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

3) If the straight line L is a tangent to the circle M of diameter 8 cm, then the distance between L and its center equals .....

   a) 3 cm b) 4 cm c) 6 cm d) 8 cm

4) If the straight line L is outside a circle of radius 3 cm and its center M, If L at distance X from its center, then $x \in$ .....

   a) $]3 , \infty[$ b) $[3 , \infty [$ c) $]6 , \infty [$ d) $]- \infty , - 6[$

5) If the straight line L at distance x from a circle of center M and radius R, $x \in]0,R[$, then L .....

   a) Intersects the circle b) Touches the circle

   c) Lies outside the circle d) Passes through the center of the circel

6) If the length of the perpendicular drawn from the center of the circle on the straight line L equals 6 cm and the radius 6 cm, then L .....

   a) Intersects the circle b) Touches the circle

   c) Lies outside the circle d) Passes through the center of the circle

7) Which of the following points does not belong to the circle that its center is the origin and its radius 7 cm?

a) (0 , 7) b) (0 , - 7) c) (7 , 0) d) (7 , 7)

8) If the surface of the circle M ∩ the surface of the circle N = {A}, then the two circles M and N are.....

a) Distant b) Concentric

c) Touching externally d) Intersecting

9) The number of circles can be drawn to pass through the end points of the line segment $\overline{AB}$ equals .....

a) 1 b) 2 c) 3 d) an infinite number

10) If the circle M ∩ the circle N = {A , B}, then the two circles M and N are .....

a) Distant b) Concentric

c) Touching externally d) Intersecting

11) If the two circles M, N are touching externally, the radius of one of them 5 cm, and MN = 9 cm, then the radius of the other circle equals .....

a) 3 cm b) 4 cm c) 7 cm d) 14 cm

12) If the two circles M, N are touching internally, the radius of one of them 3 cm, and MN = 8 cm, then the radius of the other circle equals .....

a) 5 cm b) 6 cm c) 11 cm d) 12 cm

13) M and N are two intersecting circles their radii are 5 cm, 2 cm, then MN = ...

a)]3 , 7[b) [3 , 7[c)]3 , 7] d) [3 , 7]

14) The number of circles that pass through three collinear points equals .....

a) zero b) One c) Three d) An infinte number

15) The symmetric axis of the common chord $\overline{AB}$ to the two intersecting circles M, N is .....

a) $\overleftrightarrow{MA}$ b) $\overleftrightarrow{MB}$ c) $\overleftrightarrow{MN}$ d) $\overleftrightarrow{NA}$

16) The centers of the circles which pass through the two points A, B lie on .....

a) The axis of $\overline{AB}$ b) $\overline{AB}$

c) The perpendicular to $\overline{AB}$ d) The perpendicular on $\overline{AB}$ at B

17) Number of the circles which pass through three non collinear points equals .....

a) zero b) one c) two d) three

18) The center of the circumcircle of any triangle is the point of intersection of its .....

a) Interior bisectors of its angles b) Exterior bisectors of its angles

c) its heights d) The symmetric axis of its sides

19) If the two points A, B lie on a plane AB = 4 cm, then the length of the radius of the smallest circle passes through A and B equals .....

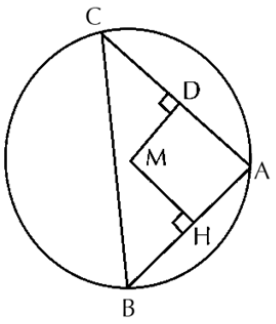
a) 2cm b) 3cm c) 4cm d) 8cm

20) If the two points A, B lie on a plane, AB = 6 cm, then the number of circles each of them has a radius of 5 cm and passes through A and B equals .....

a) zero b) 1 c) 2 d) an infinite number

Fourth: Answer the following questions

1) In the opposite figure

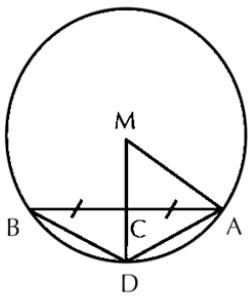


ABC is a triangle in a circle of center M,

$\overline{MD} \perp \overline{AC}$, $\overline{ME} \perp \overline{AB}$ and

BC = 8 cm Find DH

2) In the opposite figure



M circle of center M, its radius of length 13 cm,

$\overline{AB}$ is a chord of length 24 cm, C is the mid point of $\overline{AB}$, $\overline{MC}$ cuts the circle at D. Find :

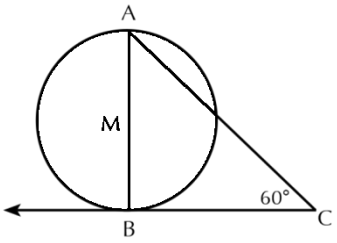
[1] The length of $\overline{MC}$ [2] the area of Δ ADB

3) In the opposite figure

A circle of circumference 44 cm, $\overline{AB}$ is a diameter

$\overleftrightarrow{BC}$ is a tangent at B, and m ($\angle C$) = 60°.

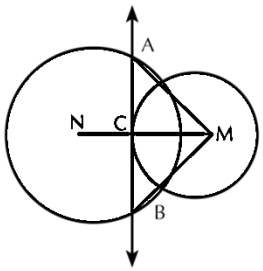
Find the length of $\overline{BC}$ ($\pi = \frac{22}{7}$)



4) In the opposite figure

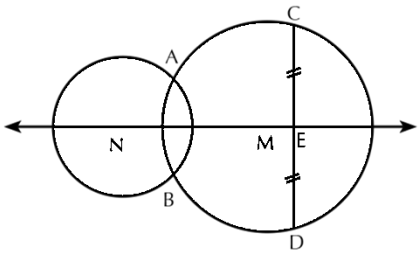
M , N are two intersecting circles, $\overline{MN}$ intersects the circle M at C, $\overline{CA}$ is a tangent to the circle M at C, and cuts the circle N at A, B Prove that :

[1] CA = CB [2] MA = MB



5) In the opposite figure

M, N are two intersecting circles, $\overline{CD}$ is a chord in the circle M, cuts $\overleftrightarrow{MN}$ at E, if E is the mid point of $\overline{CD}$ Prove that : $\overline{AB}$ // $\overline{CD}$



6) M , N are two touching internally circles at A, the circle M is greater than the circle N, draw the common tangent $\overleftrightarrow{AC}$, then draw $\overleftrightarrow{NM}$ to cut the circle N at B, and draw the tangent $\overleftrightarrow{BD}$ to the circle N to cut the circle M at D, E Prove that:

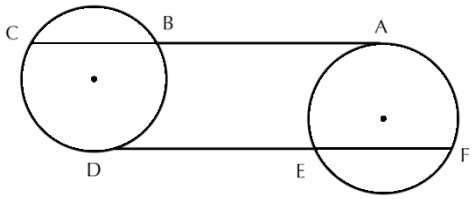
[1] $\overleftrightarrow{AC}$ // $\overleftrightarrow{BD}$

[2] BD = BE.

7) In the opposite figure

M , N are two congruent circles, $\overline{AC}$ is a common tangent to the circle M at A the, $\overline{DF}$ is a common tangent to the circle N at D, $\overline{AC}$ // $\overline{DF}$. Prove that :

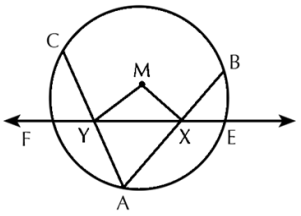
[1] BC = FE [2] AB = ED



8)) In the opposite figure

$\overline{AB}$, $\overline{CD}$ are two chords (equal in length) in a circle M. If X, Y are the two mid points of $\overline{AB}$, $\overline{AC}$ respectively, $\overleftrightarrow{XY}$ cuts the circle at E and F. Prove that :

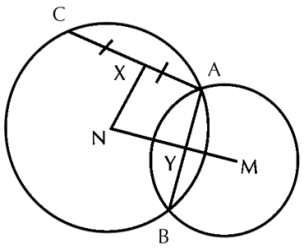
XE = YF.



9) In the opposite figure

M , N are two intersecting circles at A, B, $\overleftrightarrow{MN} \cap \overline{AB} = \{Y\}$, AB = AC, if X is the mid point of $\overline{AC}$.

Prove that : NX = NY.



10) $\overline{AB}$, $\overline{CD}$ are two parallel chords in a circle M, E is the midpoint of $\overline{AB}$, $\overrightarrow{EM}$ is drawn to cut $\overline{CD}$ at F. Prove that : FC = FD.

11) $\overline{AB}$, $\overline{AC}$ are two chords in a circle M, if D, E are the two the mid points of $\overline{AB}$, $\overline{AC}$ respectively, $\overrightarrow{DM}$ is drawn to cut $\overleftrightarrow{AC}$ at F such ME = EF. Prove that: m (∠BAC) = 45°.

12) $\overline{AB}$ is a diameter in a circle M, the chord $\overline{CD}$ is drawn such that $\overline{CD} \parallel \overline{AB}$, $\overline{CX} \perp \overline{AB}$ and $\overline{DY} \perp \overline{AB}$ Prove that : AX = BY.

13) A, B are two points wher AB = 6 cm, Draw a circle of radius 5 cm and passes through the two points A, B. Find the distance from the center to $\overline{AB}$.

14) Draw the triangle ABC in which AB = 6 cm, AC = 4 cm , m (∠BAC) = 60° . Then draw a circle passes through the two points A, C and its center $\in \overline{AB}$.

15) $\overline{AB}$ is a diameter in a circle M, $\overline{AC}$ is a chord such that m (∠BAC) = 30°, then draw $\overline{BC}$ and $\overline{MD} \perp \overline{AC}$ to cut it at D. Prove that :

[1] $\overline{MD} \parallel \overline{BC}$

[2] BC = the length of the radius of this circle.

General Exercise on the Second Unit

First : Complete the following

(1) The two opposite angles in the cyclic quadrilateral are .....

(2) The chords which opposite to equal arcs in any circle are .....

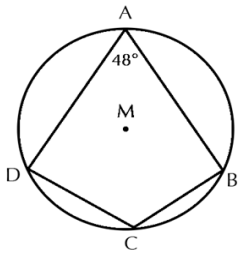
(3) The measure of the inscribed angle equals half the measure of .....

(4) In the opposite figure

In a circle M, m(∠A) = 48°, then:

[1] m(∠C) = ...

[2] m ($\overset{\frown}{BD}$) = ... " $\overset{\frown}{BD}$ is the major arc"



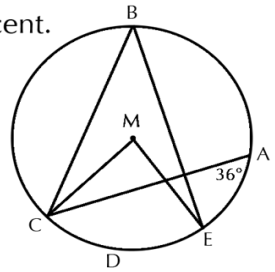
(5) The quadrilateral is said to be a cyclic quad. If the measure of an exterior angle at any vertex equals the ..... of the angle which opposite to its adjacent.

(6) In the opposite figure

In a circle M, m(∠CAE) = 36°, then:

(a) m(∠EBC) = ... (b) m(∠EMC) = ...

(c) m(∠EDC) = ...



(7) The inscribed angle which opposite to a minor arc in a circle is .....

(8) The two parallel chords in a circle intercept two ..... arcs

(9) The measure of an arc of a circle equals double .....

Second : Choose the correct answer from the given ones

1) The inscribed angle which opposite to the minor arc in a circle is .....

(a) reflex (b) right

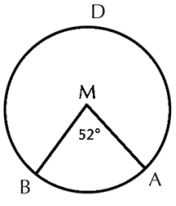
(c) obtuse (d) acute

2) In the opposite figure

In a circle M, m(∠AMB) = 52°, then

m(∠ ADB) = ... °

(a) 52° (b) 104° (c) 128° (d) 308°

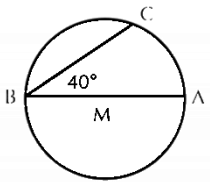


3) In the opposite figure

$\overline{AB}$ is a diameter in a circle M,

$m(\angle ABC) = 40°$, then $m(\overset{\frown}{BC}) = ...°$

(a) 40° (b) 50° (c) 90° (d) 100°



4) In the opposite figure

$\overline{AB}$ is a diameter in a circle M,

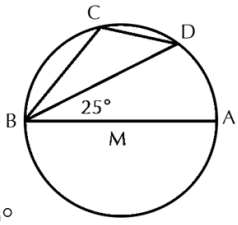
$m(\angle ABD) = 25°$, then

[1] $m(\angle DAB) = ...°$

(a) 25° (b) 50° (c) 65° (d) 90°

[2] $m(\angle DCB) = ...°$

(a) 50° (b) 100° (c) 115° (d) 125°

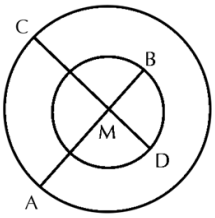


5) In the opposite figure

Two concentric circles at M, $\overline{AB} \cap \overline{CD} = \{M\}$,

if $m(\overset{\frown}{BD}) = 80°$, then $m(\overset{\frown}{AC}) = ...°$

(a) 40° (b) 80° (c) 100° (d) 160°



6) Using the following figures choose the correct answer

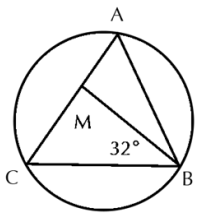


Figure (1)

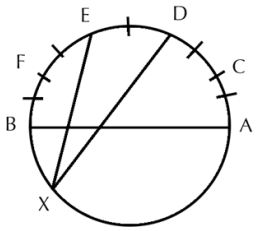


Figure (2)

In Figure (1) : A circle of center M, $m(\angle MBC) = 32°$, then $m(\overset{\frown}{BC}) = ...°$

(a) 16° (b) 32° (c) 64° (d) 116°

In Figure (2) : $\overline{AB}$ is a diameter in a circle,

$m(\overset{\frown}{AC}) = m(\overset{\frown}{CD}) = m(\overset{\frown}{DE}) = m(\overset{\frown}{EF}) = m(\overset{\frown}{FB})$, then $m(\angle DXE) = ...°$

(a) 18° (b) 36° (c) 54° (d) 72°

Model Answers

First Complete:

(1) radius (2) chord (3) diameter (4) diameter

(5) infinite (6) axis of symmetry (7) three

(8) tangent (9) parallel (10) its centre

(11) equal in length (12) >

(13) perpendicular to the common chord and bisect it

(14) distant (15) touching externally

(16) infinite (17) congruent (coincide)

(18) half the length of the line segment joining the two points.

(19) the centre of the circumcircle.

(20) inside – lies on – outside.

Second match:

(1) (d) (2) (e) (3) (a) (4) (c) (5) (b)

Third choose :

(1) c	(2) a	(3) b	(4) a	(5) a
(6) b	(7) d	(8) c	(9) d	(10) d
(11) b	(12) c	(13) c	(14) a	(15) c
(16) a	(17) b	(18) d	(19) a	(20) c

Fourth Answer the following questions:

(1) $\because \overline{MD} \perp \overline{AC}$, $\because \overline{MH} \perp \overline{AB}$

$\therefore$ D , H are mid points of $\overline{AC}$ and $\overline{AB}$ respectively

$\therefore$ DH = $\frac{1}{2}$CB = 8 ÷ 2 = 4 cm.

(2) ∵ C is a mid point of $\overline{AB}$

∴ $\overline{MC} \perp \overline{AB}$

In Δ AMC

$MC^2 = AM^2 - AC^2 = 169 - 144 = 25$

MC = 5 cm , ∵ MD = 13 cm

∴ CD = 13 – 5 = 8 cm.

area of Δ ADB = $\frac{1}{2}$ x AB x DC

= $\frac{1}{2}$ x 24 x 8 = $96cm^2$

(3) cir. = π XD $\Longrightarrow$ 44 = $\frac{22}{7}$ x D

∴ D = 14 cm

∵ $\overleftrightarrow{BC}$ is a tangent.

∴ m(∠ABC) = 90° , ∵ m(∠A) =30°

∴ BC = $\frac{1}{2}$ AC

Let BC = x , AC = 2x

$AC^2 = AB^2 + BC^2$

$(2x)^2 = (14)^2 + (x)^2$

$4x^2 = 196 + x^2$

$3x^2 = 196 \longrightarrow x^2 \simeq 65.33$

∴ x = $\sqrt{65.33} \simeq 8.08$ cm = BC

(4) ∵ $\overrightarrow{CA}$ and $\overrightarrow{CB}$ are two tangents

∴ $\overline{MA} \perp \overline{AC}$, $\overline{MB} \perp \overline{BC}$

∵ m(∠A) + m(∠B) =180°

∴ AMBC is acyclic quad.

∴ m(∠ DMB) = m(∠ ACB)

Exterior = opposite interior

(4) In circle M $\because \overleftrightarrow{AC}$ is a tangent

$\therefore \overline{MC} \perp \overleftrightarrow{AC}$, $\because C \in \overline{MN}$

$\therefore \overline{NC} \perp \overleftrightarrow{AC}$,

In circle N, $\overline{AB}$ is a chord

, $\overline{NC} \perp \overleftrightarrow{AC}$

In circle N , $\because \overline{AB}$ is a chord

, $\therefore \overline{MN} \perp \overline{AB}$,

$\therefore$ C is a mid point of $\overline{AB}$

$\Delta\Delta$ AMC , BMC

$\because \overline{MC}$ is common side

, CA = CB

, m($\angle$ MCA) = m($\angle$MCB)

$\therefore \Delta$ AMC $\equiv \Delta$ BMC

$\therefore$ MA = MB

(5) $\because$ M , N are two intersecting circles, $\overline{AB}$ is the common chord.

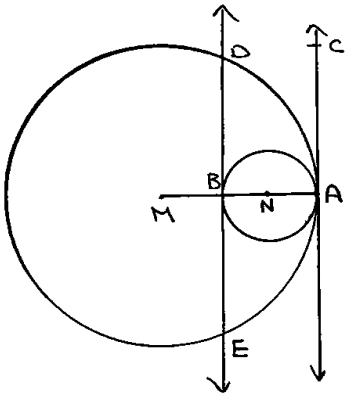
$\therefore \overline{MN} \perp \overline{AB}$, $\therefore$ m ($\angle$ AFN) = 90°

$\because$ E is a mid point of $\overline{CD}$

$\therefore \overline{FM} \perp \overline{CD}$, m ($\angle$ CEF) = 90°

$\because$ m ($\angle$ AFN) = m($\angle$ CEF) = 90° corresponding angles

$\therefore \overline{CD} // \overline{AB}$



(6) $\because \overleftrightarrow{AC}$ is the common tangent

$\therefore \overleftrightarrow{MN} \perp \overleftrightarrow{AC}$

$\because$ B $\in$ MN , $\overleftrightarrow{ED}$ tangent (N)

$\therefore \overline{MN} \perp \overline{DE}$

$\therefore \overleftrightarrow{CA} \parallel \overleftrightarrow{DE}$

$\because \overline{MA} \perp \overline{DE} \quad \Longrightarrow \overline{DE}$ is a chord in circle M

$\therefore$ B is the mid point of $\overline{DE}$

$\therefore$ BD = BE

(7) construction $\therefore$ Draw $\overline{AX}$ and $\overline{DY}$

$\because \overrightarrow{AB}$ is a tangent to circle M at A

$\therefore \overline{MA} \perp \overrightarrow{AB}$, $\because \overline{AC} \parallel \overline{FD}$

$\therefore m(\angle AXE) = 90°$

$\because \overrightarrow{DE}$ is a tangent to circle N at D

$\therefore \overline{ND} \perp \overrightarrow{DE}$, $\because \overline{AC} \parallel \overline{FD}$

$\therefore m(\angle DYB) = 90°$

$\therefore$ AXDY is a rectangle $\therefore$ AX = DY

$\because$ M and N are two congruent circles

$\therefore$ MA = ND $\therefore$ MX = NY

$\because \overline{MX} \perp \overline{EF}$, $\overline{NY} \perp \overline{BC}$

$\therefore$ EF = BC (1) (1^{st})

$\because$ Ay = XD (2)

$\because \overline{MX} \perp \overline{EF}$

$\therefore$ x is a mid point of $\overline{EF}$

similarly y is the mid point of $\overline{BC}$

$\because$ EF = BC $\therefore$ BY = XE (3)

Subtracting (3) from (2)

$\therefore$ AB = DE (2^{nd})

(8) construction: Draw $\overline{ML} \perp \overleftrightarrow{EF}$

$\because$ x and y are mid points of $\overline{AB}$ and $\overline{AC}$ respectively.

$\therefore \overline{MX} \perp \overline{AB}$ and $\overline{MY} \perp \overline{AC}$

$\because$ AB = CD

$\therefore$ MX = MY

Δ MXY is an isosceles Δ

$\therefore$ LX = LY (1)

$\because \overline{ML} \perp$ the chord $\overline{EF}$

$\therefore$ EL = LF (2)

By subtracting (1) from (2)

We get XE = YF

(9) $\because$ MN are two intersecting circles.

$\therefore \overline{MN} \perp \overline{AB}$

$\because$ x is the mid point of $\overline{AC}$

$\therefore \overline{NX} \perp \overline{AC}$

$\because$ AB = AC

$\therefore$ NX = NY

(10) $\because$ E is the mid point of $\overline{AB}$

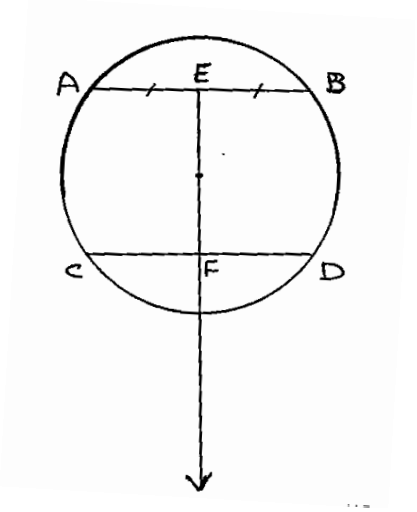
$\therefore \overline{ME} \perp \overline{AB}$

$\because \overline{AB} // \overline{CD}$

$\therefore \overline{MF} \perp \overline{CD}$

$\therefore$ F is a mid point of $\overline{CD}$

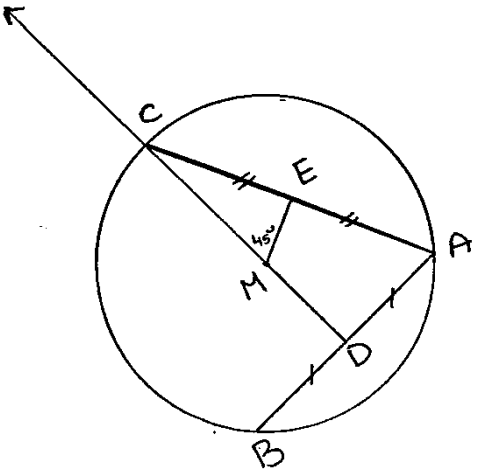
$\therefore$ FC = FD



(11) ∵ E , D are the mid point of $\overline{AB}$ and $\overline{AC}$ respectively

∴ $\overline{MD} \perp \overline{AB}$

$\overline{ME} \perp \overline{AC}$



In Δ EMF

∵ m (∠ MEF) = 90° , EM = EF

∴ m(∠ EMF) = $\frac{180-90}{2}$ = 45°

M (∠ EMD) = 180° - 45° = 135°

In the quad ADME

m (∠A) = 360° - (90° + 90° + 135°) = 45°

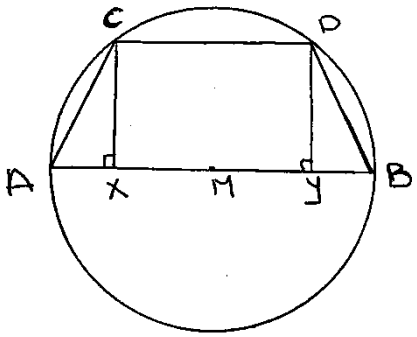
(12) constructions: Draw $\overline{AC}$ and $\overline{BD}$

∵ $\overline{CD}$ // $\overline{AB}$

∴ m ($\widehat{DB}$) = m ($\widehat{AC}$)

∴ AC = BD

ΔΔ AXC and BYD



M (∠DYB) = m (∠ CXA) = 90°

CX = DY

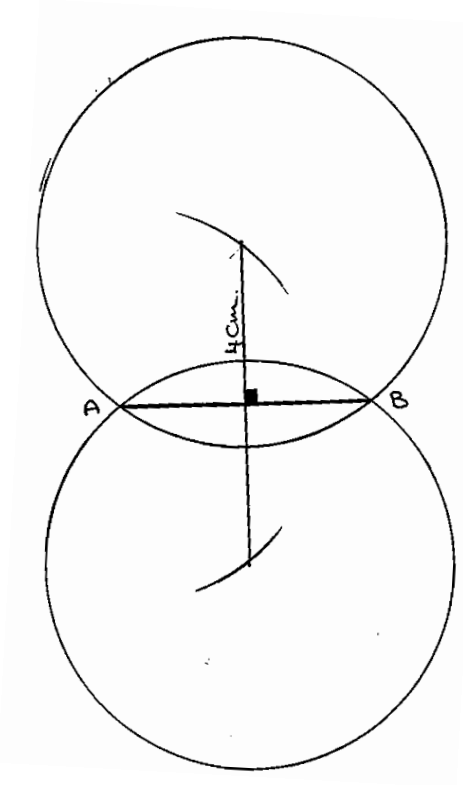
AC = DB

∴ Δ AXC ≡ Δ BYD

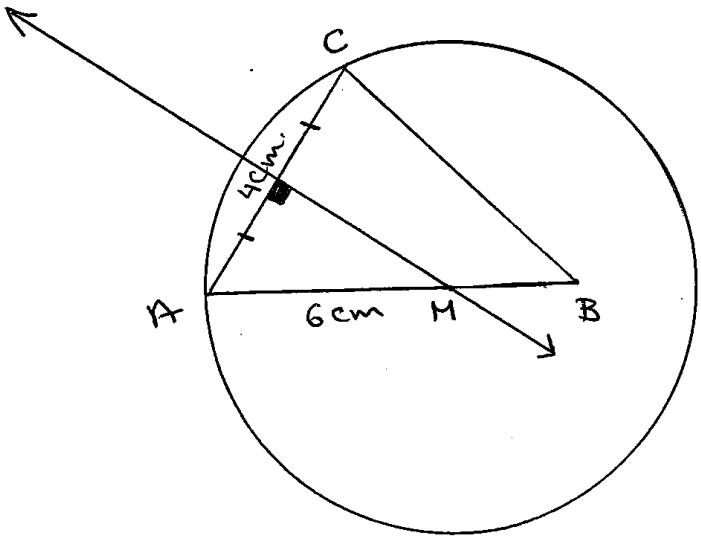
∴ AX = YB

(13) The distance is the length of the perpendicular from the centre of the circle to $\overline{AB}$

Distance = 4 cm.



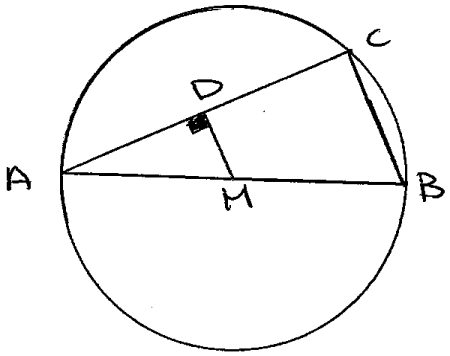
(14)



(15) ∵ $\overline{AB}$ is a diameter

∴ m (∠ACB) = 90°

inscribed (semicirlie)



∵ m (∠ ADM) = m (∠ ACB) = 90°

(corresponding)

∴ $\overline{DM}$ // $\overline{CB}$

∵ Δ ABC right angled at c

∵ m (∠A)= 30°

∴ CB = $\frac{1}{2}$ AB

General Exercise on the 2nd unit

First:

(1) supplementary (2) equal in length

(3) central angle subtended by the same arc.

(4) (1) 132° (2) 264° (5) measure

(6) a) 36° b) 72° c) 144°

(7) acute angle (8) equal

(9) the inscribed angle subtended by this arc.

Second :Choose:

(1) c (2) c (3) d (4) d (5) d (6) d,a