

**EXERCISE 14.1**

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**1. Explain the following:**

- (i) Circle
- (ii) Radius
- (iii) Centre
- (iv) Diameter
- (v) Chord
- (vi) Interior of a circle.

**Solution:**

(i) Circle – A circle is a set of all those points in a plane whose distance from a fixed point remains constant.

(ii) Radius – The radius of a circle is the distance between the all the points of the circle to its centre.

(iii) Centre – The centre of a circle is a fixed point which is at a constant distance from all the points.

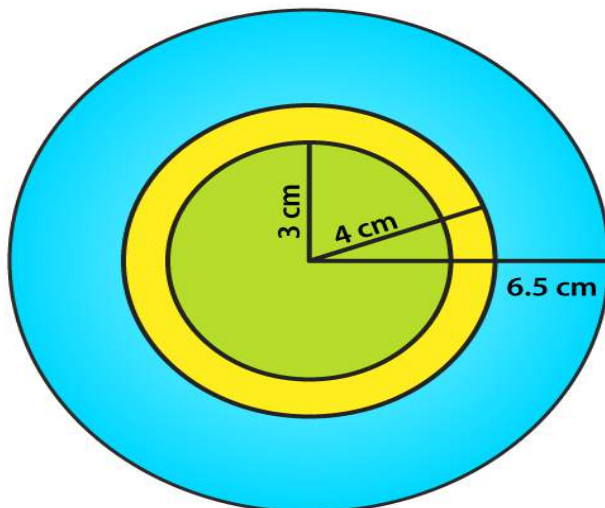
(iv) Diameter – A line segment passing through the centre of a circle, and having its end-points on the circle is called a diameter of the circle.

(v) Chord – A line segment with its end-points lying on a circle is called the chord of the circle.

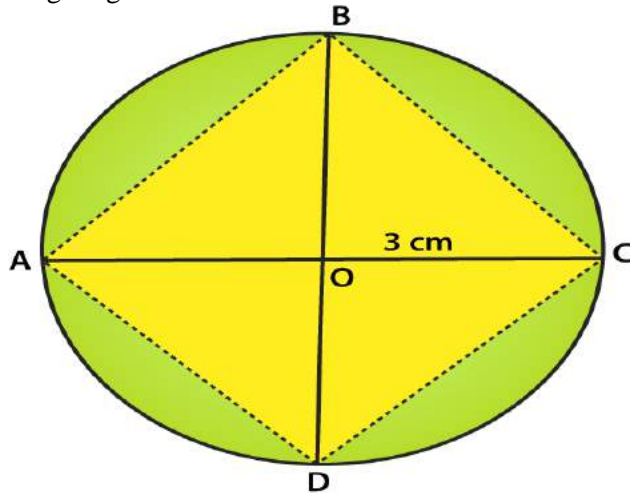
(vi) Interior of a circle – The part of a plane inside the circle consisting of all the points is called the interior of a circle.

**2. Take a point on your notebook and draw circle of radii 4 cm, 3 cm and 6.5 cm, each having the same centre O.****Solution:**

The figure given below shows circles of 4 cm, 3 cm and 6.5 cm radii having the same centre.

**3. Draw a circle with centre O and any radius. Draw AC and BD two perpendicular diameters of the circle. Join AB, BC, CD and DA.****Solution:**

The figure given below shows a circle with centre O and two perpendicular diameter AC and BD.



4. Draw a circle with centre O and radius 6 cm. Mark points P, Q, R such that

- (i) P lies on the circle,
- (ii) Q lies in the interior of the circle, and
- (iii) R lies in the exterior of the circle.

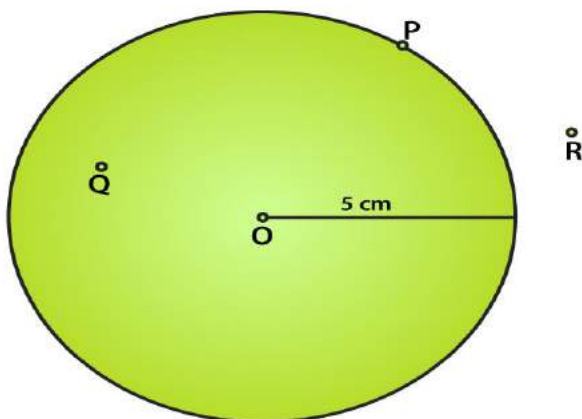
Rewrite each of the following statements using the correct symbol ( $=$ ,  $<$  or  $>$ ):

- (i)  $OQ \dots\dots 5 \text{ cm}$
- (ii)  $OP \dots\dots 5 \text{ cm}$
- (iii)  $OR \dots\dots 5 \text{ cm}$ .

**Solution:**

The figure given below shows the points P, Q and R such that

- (i) P lies on the circle,
- (ii) Q lies in the interior of the circle, and
- (iii) R lies in the exterior of the circle.



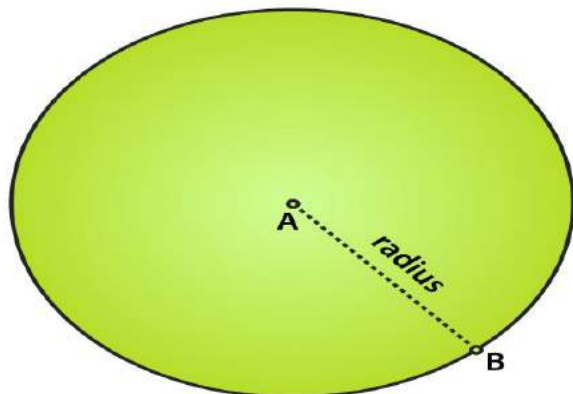
The statements can be written as

- (i)  $OQ < 5 \text{ cm}$
- (ii)  $OP = 5 \text{ cm}$
- (iii)  $OR > 5 \text{ cm}$

**5. Take two points A and B on the page of your note book. Draw a circle with centre A which passes through B.**

**Solution:**

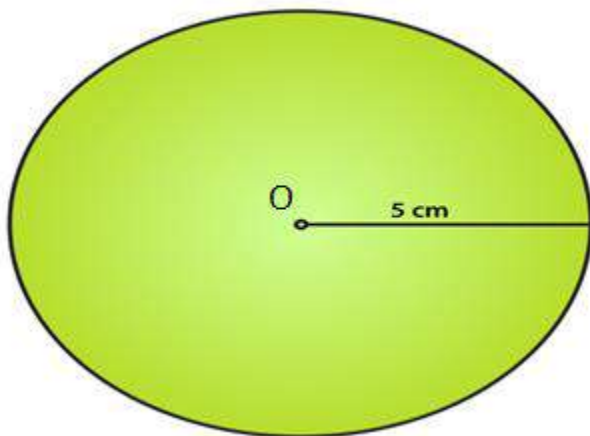
The figure given below shows the circle with A as centre and a line which passes through B.



**6. Draw a semi-circle with centre O and radius 5 cm. Is the diameter that determines the semi-circle, a part of the semi-circle?**

**Solution:**

The figure given below shows a semi-circle with centre O and radius 5 cm.



We know that a semi-circle is the end point of a diameter which divides the circle into two equal parts. No, the diameter does not determine the semi-circle and it is the end points of the diameter which finds the semi-circle or a part of the semi-circle.

**7. The diameter of a circle is 14 cm, find its radius.**

**Solution:**

It is given that

Diameter of a circle = 14 cm

We know that

Radius of a circle = Diameter / 2

By substituting the values

Radius of a circle =  $14/2 = 7$  cm.

**8. Given a circle with centre O and radius 2.5 cm, what is the length of the longest chord of the circle.**

**Solution:**

We know that the diameter of a circle is its longest chord which is twice its radius.

So the length of the longest chord of the circle =  $2(2.5) = 5$  cm.

**9. Fill in the blanks:**

- (i) The diameter of a circle is ..... times its radius.
- (ii) The diameter of a circle is the ..... chord of the circle.
- (iii) The diameter of a circle pass through .....
- (iv) A chord of a circle is a line segment with its end points on the .....
- (v) If we join any two points on a circle by a line segment, we obtain ..... of the circle.
- (vi) A radius of a circle is a line segment with one end at ..... and the other end at .....
- (vii) All radii of a circle are .....
- (viii) The diameters of a circle are .....
- (ix) The total number of diameters of a circle is .....
- (x) Every point on a circle is ..... from its centre.
- (xi) A chord of a circle contains exactly ..... points of the circle.
- (xii) A diameter is the longest .....
- (xiii) Concentric circles are circles having .....

**Solution:**

- (i) The diameter of a circle is two times its radius.
- (ii) The diameter of a circle is the longest chord of the circle.
- (iii) The diameter of a circle pass through its centre.
- (iv) A chord of a circle is a line segment with its end points on the circle.
- (v) If we join any two points on a circle by a line segment, we obtain chord of the circle.
- (vi) A radius of a circle is a line segment with one end at centre and the other end at circle.
- (vii) All radii of a circle are equal.
- (viii) The diameters of a circle are concurrent.
- (ix) The total number of diameters of a circle is infinite.
- (x) Every point on a circle is equidistant from its centre.
- (xi) A chord of a circle contains exactly two points of the circle.
- (xii) A diameter is the longest chord.
- (xiii) Concentric circles are circles having same centre.

**10. In each of the following, state if the statement is true (T) or false (F):**

- (i) Every circle has a centre.**
- (ii) The centre of a circle is a point of the circle.**
- (iii) Any two radii of a circle make up a diameter.**
- (iv) Every chord of a circle is parallel to some diameter of the circle.**
- (v) A circle is symmetric about each of its diameters.**
- (vi) The diameter is twice the radius.**
- (vii) A radius is a chord of the circle.**
- (viii) Concentric circles have the same radii.**
- (ix) The nearer a chord to the centre of a circle, the longer is its length.**

**Solution:**

- (i) True.
- (ii) False.
- (iii) False.
- (iv) False.
- (v) True.
- (vi) True.
- (vii) False.
- (viii) False.
- (ix) True.

**OBJECTIVE TYPE QUESTIONS**

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Mark the correct alternative in each of the following:

**1. A circle of radius  $r$  cm has diameter of length**

- (a)  $r$  cm
- (b)  $2r$  cm
- (c)  $4r$  cm
- (d)  $r/2$  cm

**Solution:**

The option (b) is the correct answer.

A circle of radius  $r$  cm has diameter of length  $2r$  cm.**2. A chord of a circle passing through its centre is equal to its**

- (a) radius
- (b) diameter
- (c) circumference
- (d) none of these

**Solution:**

The option (b) is the correct answer.

A chord of a circle passing through its centre is equal to its diameter.

**3. The total number of diameters of a circle is**

- (a) 1
- (b) 2
- (c) 4
- (d) uncountable number

**Solution:**

The option (d) is the correct answer.

The total number of diameters of a circle is uncountable number.

**4. By joining any two points on a circle, we obtain its**

- (a) radius
- (b) diameter
- (c) chord
- (d) circumference

**Solution:**

The option (c) is the correct answer.

By joining any two points on a circle, we obtain its chord.

**5. The longest chord of a circle is equal to its**

- (a) radius
- (b) diameter
- (c) circumference
- (d) perimeter

**Solution:**

The option (b) is the correct answer.

The longest chord of a circle is equal to its diameter.

**6. How many circles can be drawn to pass through two given points?**

(a) 1

(b) 2

(c) 0

(d) As many as possible

**Solution:**

The option (d) is the correct answer.

Many circles can be drawn to pass through two given points.

**7. How many circles can be drawn to pass through three non-collinear points?**

(a) 1

(b) 2

(c) 0

(d) As many as possible

**Solution:**

The option (a) is the correct answer.

Only 1 circle can be drawn to pass through three non-collinear points.