

Chapter 14: Circles

Exercise 14.1 page: 14.4

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.

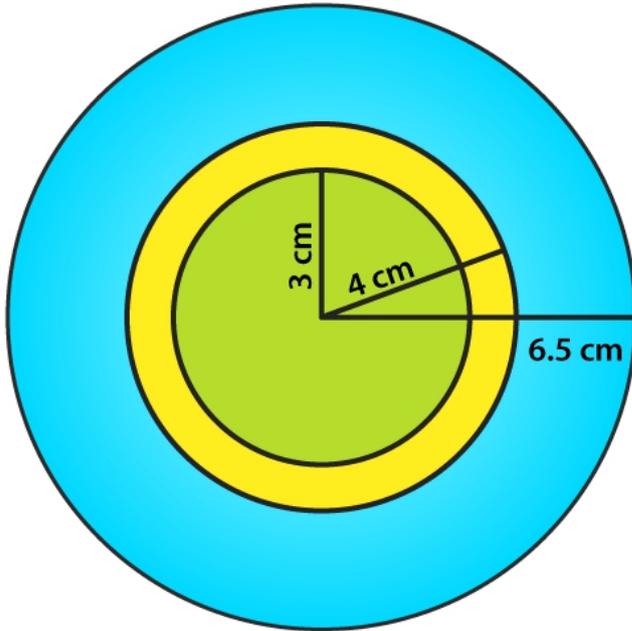
(v) Chord – A line segment with its end-points lying on a circle is called the chord of the circle.

(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:

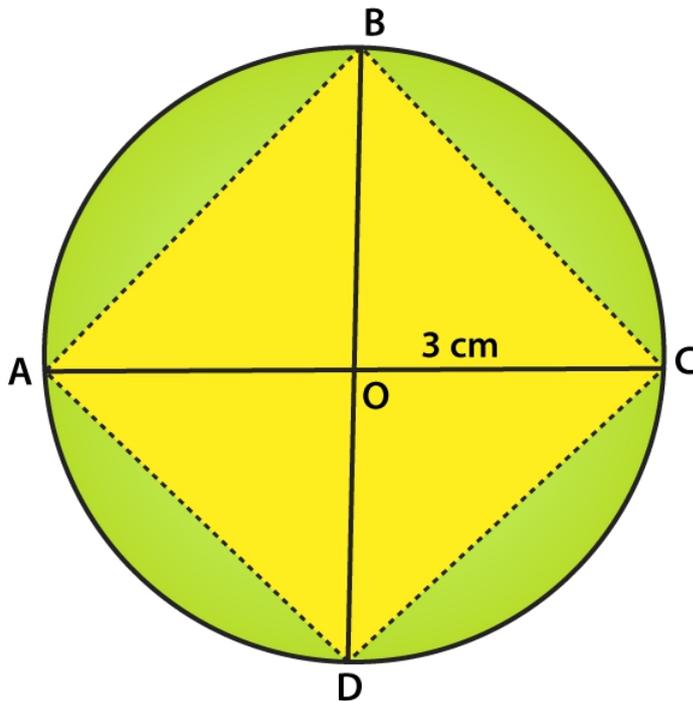
The figure given below shows circles of 4 cm, 3 cm and 6.5 cm radii having the same centre.



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.

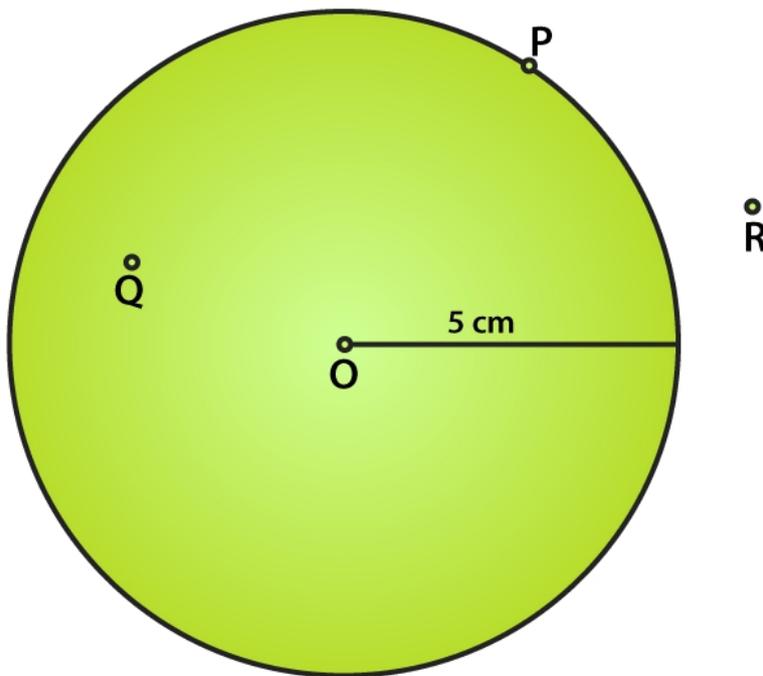
Rewrite each of the following statements using the correct symbol ($=$, $<$ or $>$):

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

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.



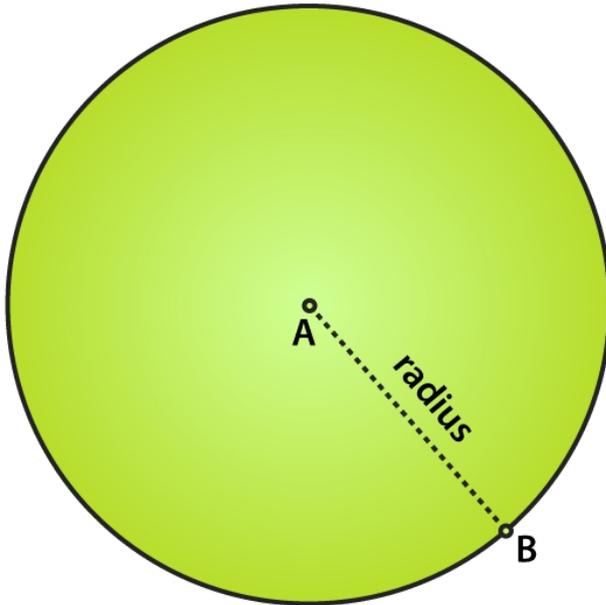
The statements can be written as

- (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:

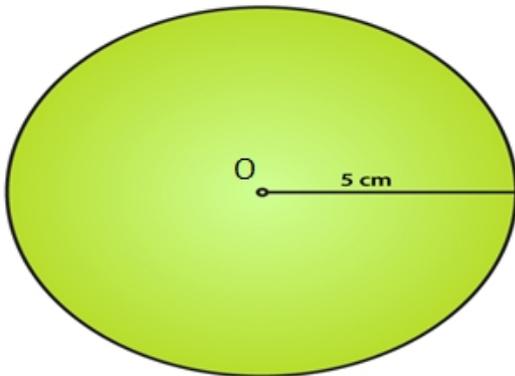
The figure given below shows the circle with A as centre and a line which passes through B.



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 page: 14.5

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.