

# Circle

## Exercise 14.1

### Question: 1

Explain the following:

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

### Solution:

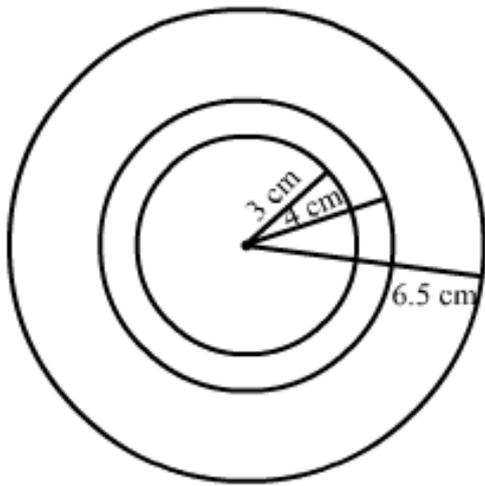
- (i) A circle is a set of all those points in a plane, whose distance from a fixed point remains constant.
- (ii) Radius of a circle is a line segment with one end at its centre and the other end on the circle. (It is the constant distance between all the points on the circle and its centre.)
- (iii) The centre of a circle is that fixed point from which all points remain at a constant distance.
- (iv) Diameter of a circle is a line segment passing through the centre of a circle, and having its end points on the circle.
- (v) A chord of a circle is a line segment with its end points lying on the circle.
- (vi) Interior of a circle is a set of all those points which lie inside the circle.

### Question: 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 given figure shows circles of radii 4 cm, 3 cm and 6.5 cm, respectively.

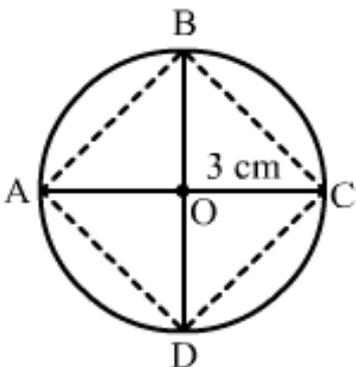


### Question: 3

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 is shown below:



### Question: 4

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

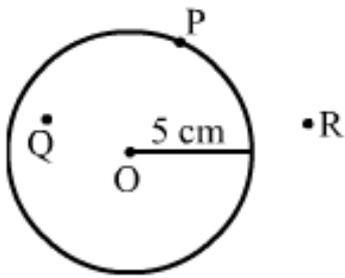
- (i)  $P$  lies on the circle,
- (ii)  $Q$  lies in the interior of the circle, and
- (iii)  $R$  lies in the exterior of the circle,

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

- (i)  $OP \dots 5$  cm
- (ii)  $OQ \dots 5$  cm
- (iii)  $OR \dots 5$  cm

### Solution:

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



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

correct symbol

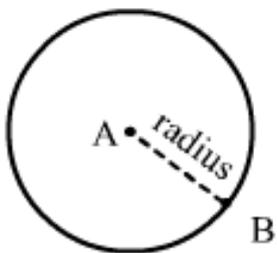
- (i)  $OQ < 5 \text{ cm}$
- (ii)  $OP = 5 \text{ cm}$
- (iii)  $OR > 5 \text{ cm}$

### Question: 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 is shown below:

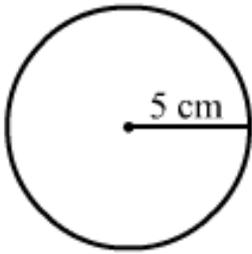


### Question: 6

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 semi-circle with centre O and radius 5 cm is shown below:



The end point of a diameter of a circle divides it into two equal parts, and each part is called a semi-circle. So, it is not the diameter, but end points of the diameter that determines the semi-circle or a part of the semi-circle.

### **Question: 7**

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

### **Solution:**

The radius of a circle is half of its diameter. Therefore, the radius = diameter/2

$$\text{Radius} = 14/2 = 7 \text{ cm}$$

### **Question: 8**

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

### **Solution:**

The diameter of a circle is its longest chord. The diameter of a circle is twice of its radius. Length of the longest chord is:  $2 \times 2.5 = 5 \text{ cm}$

### **Question: 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 passes through .....
- (iv) A chord of a circle is a line segment with its end points on the.....
- (v) If you 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) two
- (ii) longest
- (iii) The centre of the circle
- (iv) circle
- (v) chord
- (vi) the centre, on the circle
- (vii) equal
- (viii) concurrent
- (ix) infinite
- (x) equidistant
- (xi) two
- (xii) chord
- (xiii) the same centre point

### **Question: 10**

In each of the following, state if the statement is true (T) of 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) T
- (ii) F
- (iii) F
- (iv) F
- (v) T
- (vi) T
- (vii) F
- (viii) F
- (ix) T