



## MATHS

# NCERT - NCERT MATHEMATICS(TAMIL ENGLISH)

## CIRCLES

### Example

1. Construct a circumcircle of the triangle ABC where  
 $AB = 5\text{cm}$ ,  $\angle B = 75^\circ$  and  $BC = 7\text{cm}$



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2. In the figure, O is the centre of the circle. Find the length of CD, if  $AB = 5$  cm.



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3. In the adjacent figure, there are two concentric circles with centre 'O'. Chord AD of the bigger circle intersects the smaller circle at B and C. Show that  $AB = CD$ .



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4. Let 'O' be the centre of a circle, PQ is a diameter, then prove that  $\angle PRQ = 90^\circ$  (OR) Prove that angle in a semi-circle is right angle.



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5. Find the value of  $x^\circ$  in the adjacent figure



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6. In the figure,  $\angle A = 120^\circ$  then find  $\angle C$  ?



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7. In figure,  $\overline{AB}$  is a diameter of the circle,  $\overline{CD}$  is a chord equal to the radius of the circle.  $\overline{AC}$  and  $\overline{BD}$  when extended intersect at a point E. Prove that  $\angle AEB = 6^\circ$ .



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## Do This

1. In the figure, which circles are congruent to the circle A?



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2. What measure of the circles make them congruent?

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## Try This

1. In a circle with centre 'O' .  $\overline{AB}$  is a chord and 'M' is its midpoint . Now prove that  $\angle(OM)$  is perpendicular to AB



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2. if three points are collinear , how many circles can be drawn through these points? Now, try to draw a circle passing through these three points.

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3. In the figure, O is the centre of the circle and  $AB = CD$ . OM is perpendicular on  $\overline{AB}$  and  $\overline{ON}$  is perpendicular on  $\overline{CD}$ . Then prove that  $OM = ON$ .



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## Exercise 12.1

1. Name the following parts from the adjacent figure where 'O' is the centre of the circle



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2. State true or false .

A circle divides the plane on which it lies into three parts.



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3. State true or false .

The region enclosed by a chord and the major arc is



major segment



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4. State true or false .

The region enclosed by a chord and the major arc is  
major segment



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5. State true or false .

A diameter divides the circle into two unequal parts.



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6. State true or false .

A sector is the area enclosed by two radii and a chord



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7. State true or false .

The longest of all chords of a circle is called a diameter.



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8. State true or false .

The mid point of any diameter of a circle is the centre.



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## Exercise 12 2

1. In the figure , if  $AB = CD$  and  $\angle AOB = 90^\circ$  find  $\angle COD$



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2. In the figure ,  $PQ = RS$  and  $\angle ORS = 48^\circ$  . Find  $\angle OPQ$  and  $\angle ROS$



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3. In the figure  $PR$  and  $QS$  are two diameters. Is  $PQ = RS$ ?



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1. Draw the following triangles and construct circumcircles for them.

In

$\triangle ABC$ ,  $AB = 6\text{cm}$ ,  $BC = 7\text{cm}$  and  $\angle A = 60^\circ$



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2. Draw the following triangles and construct circumcircles for them.

in

$\triangle PQR$ ,  $PQ = 5\text{cm}$ ,  $QR = 6\text{cm}$  and  $RP = 8.2\text{cm}$



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3. Draw the following triangles and construct circumcircles for them.

In

$\Delta XYZ$ ,  $XY = 4.8\text{cm}$ ,  $\angle X = 60^\circ$  and  $\angle Y = 70^\circ$



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4. Draw two circles passing through A, B where  $AB = 5.4\text{cm}$



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5. If two circles intersect at two points, then prove that their centres lie on the perpendicular bisector of the common chord.



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6. If two intersecting chords of a circle make equal angles with diameter passing through their point of intersection, prove that the chords are equal.



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7. In the adjacent figure, AB is a chord of circle with centre O. CD is the diameter perpendicular to AB.

Show that  $AD = BD$



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## Exercise 12 4

1. In the figure 'O' is the centre of the circle

$\angle AOB = 100^\circ$  find  $\angle ADB$



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2. In the figure  $\angle BAD = 40^\circ$  then find  $\angle BCD$



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3. In the figure ,  $O$  is the centre of the circle and  $\angle POR = 120^\circ$  . Find  $\angle PQR$  and  $\angle PSR$



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4. If a parallelogram is cyclic, then it is a rectangle.

Justify.



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5. In the figure, 'O' is the centre of the circle.  $OM = 3\text{cm}$  and  $AB = 8\text{cm}$ . Find the radius of the circle



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6. In the figure, 'O' is the centre of the circle and OM, ON are the perpendiculars from the centre to the chords PQ and RS. If  $OM = ON$  and  $PQ = 6\text{cm}$ . Find RS



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7. A is the centre of the circle and ABCD is a square. If  $BD = 4\text{cm}$  then find the radius of the circle



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8. Draw a circle with any radius and then draw two chords equidistant from the centre



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9. In the given figure 'O' is the centre of the circle and AB, CD are equal chords. If  $\angle AOB = 70^\circ$ . Find the angles of the  $\triangle OCD$



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Exercise 12 5

1. Find the values of  $x$  and  $y$  in the figures given below



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2. Given that the vertices  $A, B, C$  of a quadrilateral  $ABCD$  lie on a circle. Also  $\angle A + \angle C = 180^\circ$ , then prove that the vertex  $D$  also lie on the same circle.



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3. Prove that a cyclic rhombus is a square



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4. For each of the following, draw a circle and inscribe the figure given. If a polygon of the given type can't be inscribed, write not possible. (a) Rectangle (b) Trapezium (c) Obtuse triangle (d) Non-rectangular parallelogram (e) Acute isosceles triangle



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5. (f) A quadrilateral PQRS with PR as diameter.



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