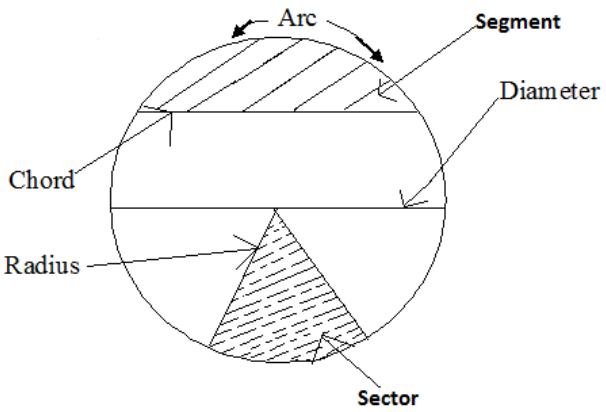
CHAPTER ONE
Circle

The Circle:



Parts of the circle:

1.The circumference**:**: This is the distance around the circle.

2 .The radius: This is a line which is drawn from the centre, to a point on the circumference.

3 ,The Chord: Is a line which joins two points on the circumference

4 ,The sector: Is the region between two radii

5. Segment: Is the region between the chord and part of the circumference.

6, Diameter: Is a line which joins two points on the circumference, and passes through the centre.

7. The Arc: Is part of the circumference.

N/B: For a circle, D = 2r where D = the diameter and r = the radius. Also C = $2\pi r$, where r = the radius, $\pi = \frac{22}{7}$ or $\pi = 3.14$ and C = Circumference.

Q1. The radius of a circle is 14cm. Find its circumference.

Soln. Method (1)

r = 14cm, C =?, $\pi = \frac{22}{7}$. $Since\ C = 2\pi r => C = 2 \times \frac{22}{7} \times 14 => C = 88cm.$ $\therefore Circumference = 88cm.$

Method (2)

r = 14cm, C =?, $\pi = 3.14$. From $C = 2\pi r => C = 2 \times 3.14 \times 14 = 6.28 \times 14 = 88cm$

Q2. A circle has a radius of 7cm. Find the distance around it.

Soln.

r = 7cm, $\pi = \frac{22}{7}, C = ?. From \quad C = 2\pi r => C = 2 \times \frac{22}{7} \times 7 => C = 44cm.$

Method (2)

r = 7cm, $\pi = 3.14, \quad C = ?. From \quad C = 2\pi r => C = 2 \times 3.14 \times 7 = 6.28 \times 7, => C = 44cm.$

Q3. The diameter of a circle is 40cm. Calculate its circumference.[Take $\pi = 3.14$]..

Soln.

D = 40cm $=> r = \frac{40}{2} = 20cm\ From\ C = 2\pi r = 2 \times 3.14 \times 20 => C = 125.6cm$

Q4. A farm is circular in shape with a diameter of 20m. Find the distance covered by a man, who walks around the field

(a) once b) twice

[Take $\pi = 3.14$].

N/B: The distance covered by walking round the field once is equal to the circumference. Also the distance covered by walking round the field twice is twice the circumference.

Soln.

D = 20m $=> r = \frac{20}{2} = 10m\ C = 2\pi r = 2 \times 3.14 \times 10 = 62.8m$

a. The distance covered by moving round the field once = 62.8m.
b. Distance covered moving round the field twice = 2 x 62.8 = 125.6m.

Q5.The circumference of a circle is 628m. Find its radius. [Take $\pi = 3.14$].

Soln.

C = 628m, r =?, and $\pi = 3.14. From\ \ C = 2\pi r => 628 = 2 \times 3.14 \times r, => 628 = 6.28r, => 6.28r = 628 => r = \frac{628}{6.28}$. Multiply the top and down numbers by 100 to remove the decimal point. $=> r = \frac{628 \times 100}{6.28 \times 100} = \frac{62800}{628} = 100, => r = 100m\ , \therefore radius$

$= 100m.$

Q6. The circumference of a circle is 308m. Calculate its

a) Radius. b) diameter

Take $\pi = \frac{22}{7}$

Soln.

C = 308m, r = ? and $\pi = \frac{22}{7}. From\ C = 2\pi r => 308 = 2 \times \frac{22}{7} \times r, => 308 = \frac{44r}{7} => 7 \times 308 = 44r, => 308 = \frac{44r}{7} => 7 \times 308 = 44r, => 44r = 2156, => r = \frac{2156}{44} = 49m, => D = 2r = 2 \times 49 = 98m.$

Q7. The radius of a wheel is 49cm. Find the distance it will travel when it rotates

a) once b) twice

N/B: The distance covered by the wheel when it turns once = the circumference of the wheel.

Soln.

r = 49cm, $\pi = \frac{22}{7}, C = ? From\ C = 2\pi r => C = 2 \times \frac{22}{7} \times 49; => C = 2 \times 22 \times 7 = 308cm => circumference = 308cm.$

a) Distance covered when the wheel turns once = 308cm.
b) The distance covered when it turns twice = 2 x308 = 616cm.

Q8. The distance travelled by a wheel when it rotates once is 88mm. Calculate the diameter of the wheel. [Take $\pi = \frac{22}{7}$].

N/B: To find the diameter, first find the radius and multiply it by 2.

Soln.

C = 88mm, $\pi = \frac{22}{7}, r = ?\ From$ C = $2\pi r => 88 = 2 \times \frac{22}{7} \times r.$

$\therefore 88 = \frac{44r}{7} => 7 \times 88 = 44r, => 616 = 44r => 44r = 616, => r = \frac{616}{44} = > r = 14mm.$

$D = 2r = 2 \times 14 = 28mm.$

Q9. The distance round a car tyre is 132cm.

Taking$\pi = \frac{22}{7}, find\ \ its\ diameter.$

Soln.

C = 132, $\pi = \frac{22}{7}, r = ?\ From\ C = 2\pi r => 132 = 2 \times \frac{22}{7} \times r \therefore 132 = \frac{44r}{7} => 7 \times 132 = 44r => 924 = 44r => 44r = 924 => r = \frac{924}{44} => r = 21 => D = 2r = 2(21) = 42cm$