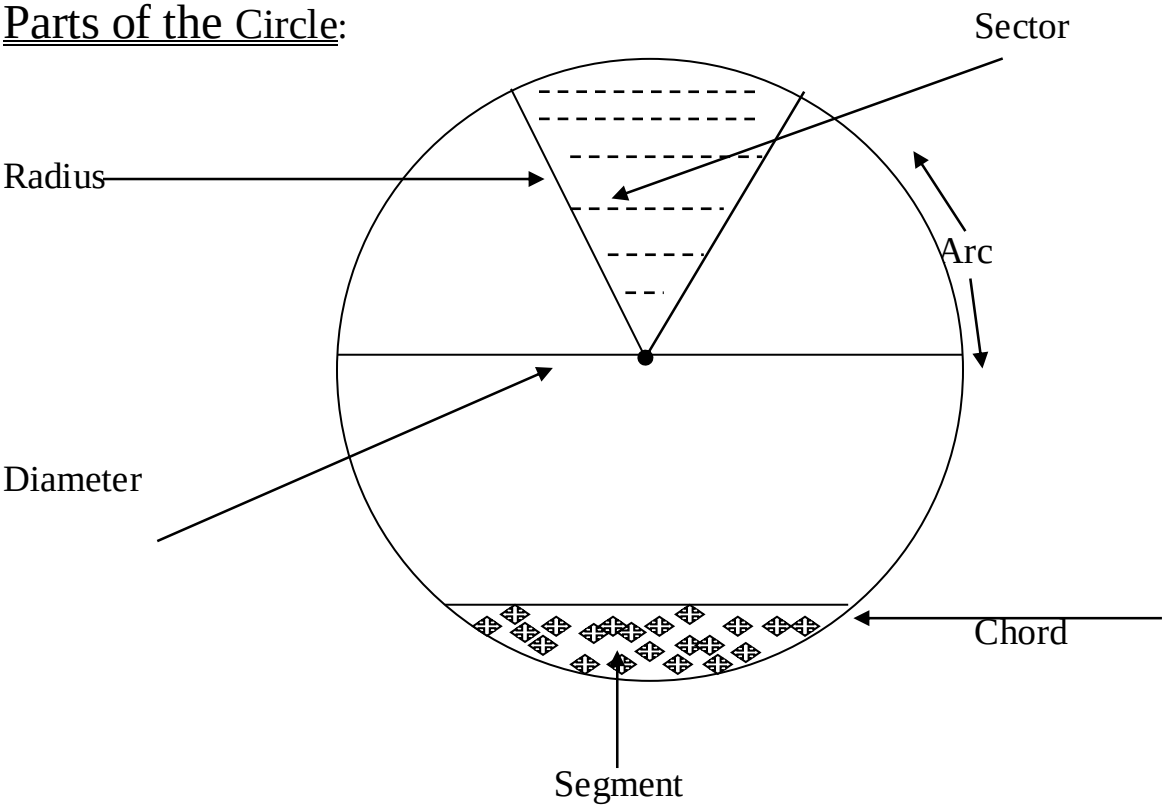
CHAPTER TEN

Circle

The Circle:

Parts of 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 center.

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

Method (2)

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

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

Soln.

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

Method (2)

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

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

Soln.

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

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

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

a) radius. b) diameter.
{Take $\pi = \frac{22}{7}$}.

Soln.

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

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

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