

Learning materials :-

- **Origin:-** position of any object changes with respect to that fixed point ,that fixed point is known as origin.
- **To locate the position of a particle in a plane we have to specify three things.**
A) Origin B) Distance .c) Direction
- **Distance:-** The actual length of the path covered by a moving body between its initial and final position is called the distance covered by the body.it has no sense of direction it is a scalar quantity.
- **Displacement:-** The shortest distance between the initial and final position of a body is called the Displacement of the body.it is directed from the initial to the final position. Displacement is a vector quantity.
- **When a body moves in a straight line without reversing its direction then distance is equal to displacement.**
- **When a body moving in a straight line reverses its direction then distance is greater than displacement**
- **Displacement can have a negative value in rectilinear motion.**
- **When motion of a body is in a curved path then distance is greater than displacement Example : - when a car starts from initial position i and move in a semicircular path in clockwise direction and reach final position f which is diametrically opposite to it.**
- **We observe in this case distance = $\pi \times \text{radius}$**
As you know that circumference of a semicircle = $\pi \times \text{radius}$
Displacement = initial position to final position = diameter = $2 \times \text{radius}$
Here $\pi \times \text{radius}$ is greater than two times of radius. Because the value of $\pi = 3.141619 \dots$ is greater than 2

- When a car completes a circle then distance is equal to the circumference of the circle $=2 \times \pi \times \text{radius}$.
Displacement =0
 - The displacement of the moving body is zero if initial and final point of body is same .
- ** Difference between distance and displacement .**

Distance :-1) The actual length of path covered by a moving body between its initial and final position is called the distance covered by the body.

2)Distance is not associated with direction.

3)Distance is a scalar quantity.

4) It is always positive.

5)It can not have a value zero for a moving body.

*** Displacement :- The shortest distance between initial and final position of a moving body is called the displacement of the body and is directed from initial to final position.**

2) Direction is associated with displacement

3)Displacement is a vector quantity.

4)It can be positive or negative.

5)It can be zero if initial and final position is the same.

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