

1. What is a circular motion? How is uniform circular regarded as an accelerated motion
Explain?

Ans Uniform circular motion, motion of a particle moving at a constant speed on a circle.
Uniform circular motion is accelerated because the velocity changes due to continuous changes in the direction of motion. So -

2. An object is moving with uniform speed in a circle of radius r , calculate the distance and displacement (a) when it completes half the circle, (c) what type of motion does the object possess? (b) when it completes full circle

Ans The radius of the circle = r

(i) When it completes half circle:

$$\text{Distance} = \frac{\text{Circumference}}{2} = \frac{2\pi r}{2}$$

$$\text{Distance} = \pi r$$

$$\text{Displacement} = r + r = 2r$$

v) When it completes $\frac{3}{4}$ th of the circle:-

The displacement = AB is

By using Pythagoras theorem

$$AB^2 = r^2 + r^2$$

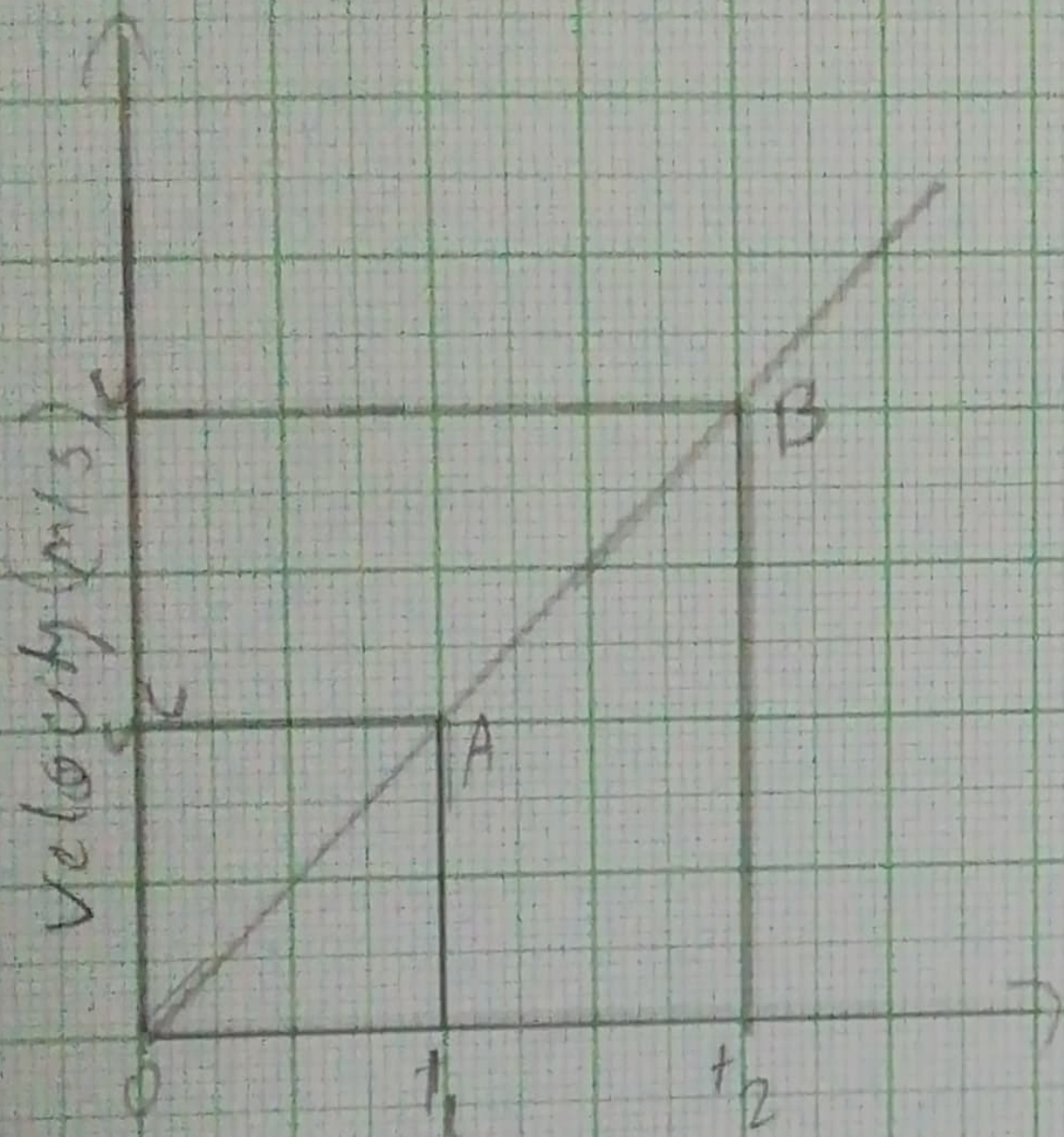
$$\Rightarrow AB^2 = 2r^2$$

$$\Rightarrow AB = \sqrt{2}r$$

The displacement = $\sqrt{2}r$

$$\text{Distance} = \frac{3}{2} \pi r$$

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$$\Rightarrow a = \frac{V - v}{t_2 - t_1}$$

$$\Rightarrow a = \frac{V - v}{t}$$

$$\text{or } v - v = at$$
$$\Rightarrow v = v + at$$

Q Write the three equations for the uniformly accelerated motion. Also derive the second and third equations by graphical method.

Ans The three equations of uniformly accelerated motion the initial velocity are

$$i) \quad v = u + at$$

$$ii) \quad s = ut + \frac{1}{2}at^2$$

$$iii) \quad v^2 = u^2 + 2as$$