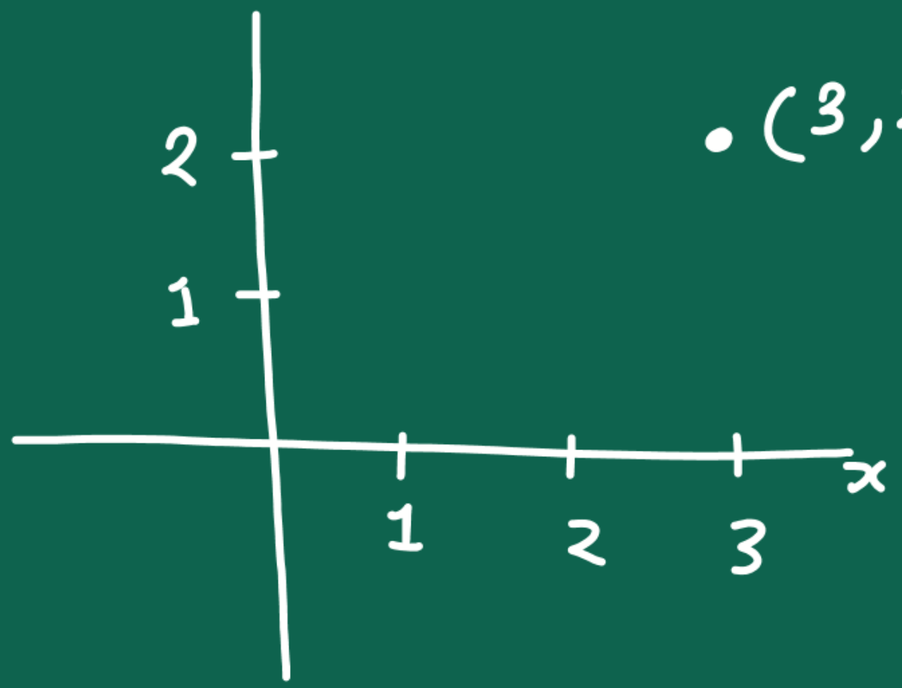
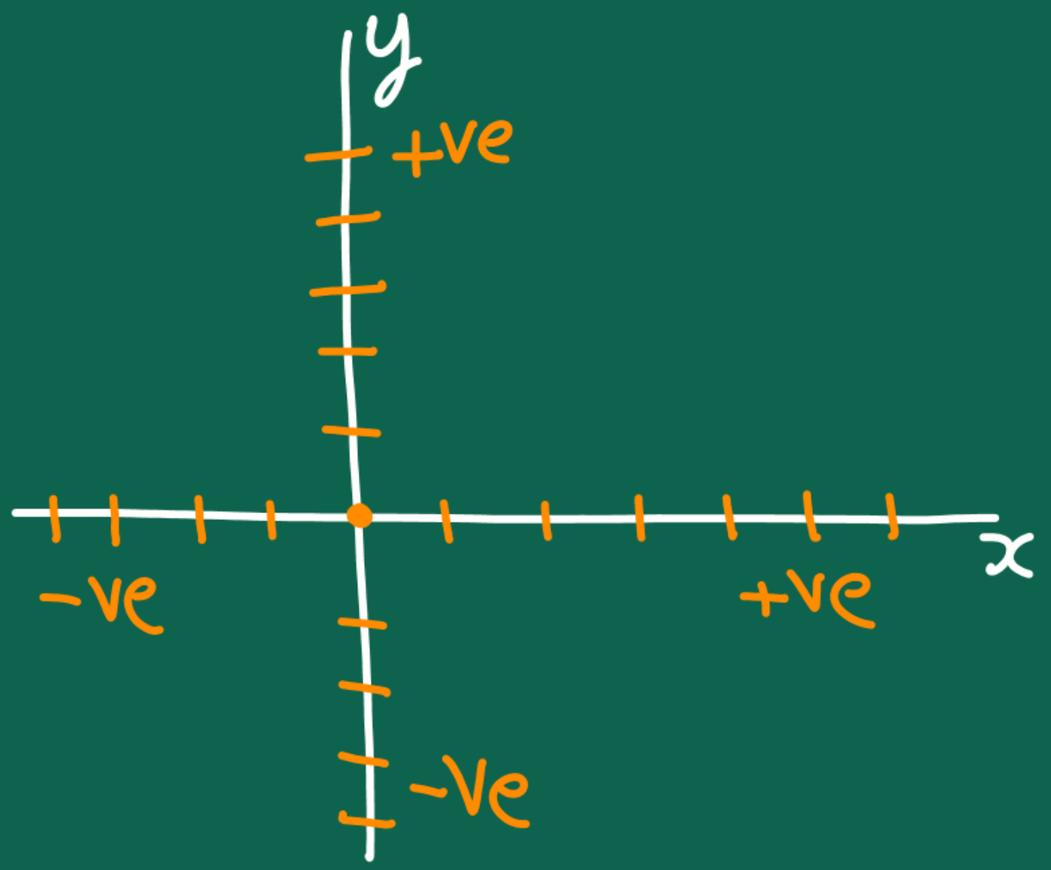
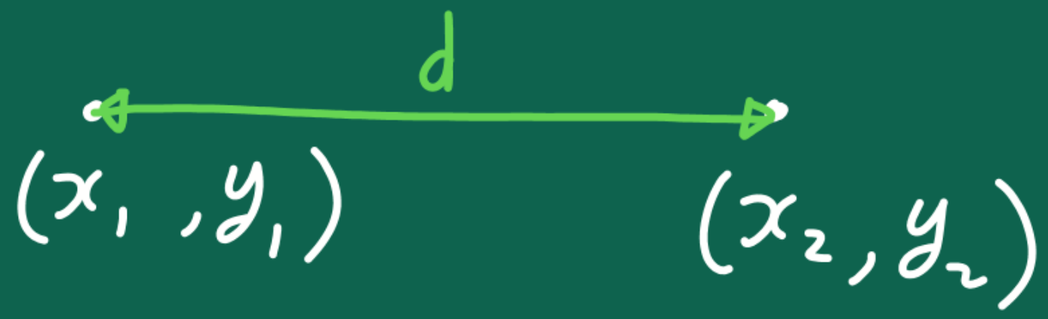
welcome to physics

Class - 11th


2
1
(3,2)
x
1
2
3


y
+ve
x
-ve
+ve
-ve



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

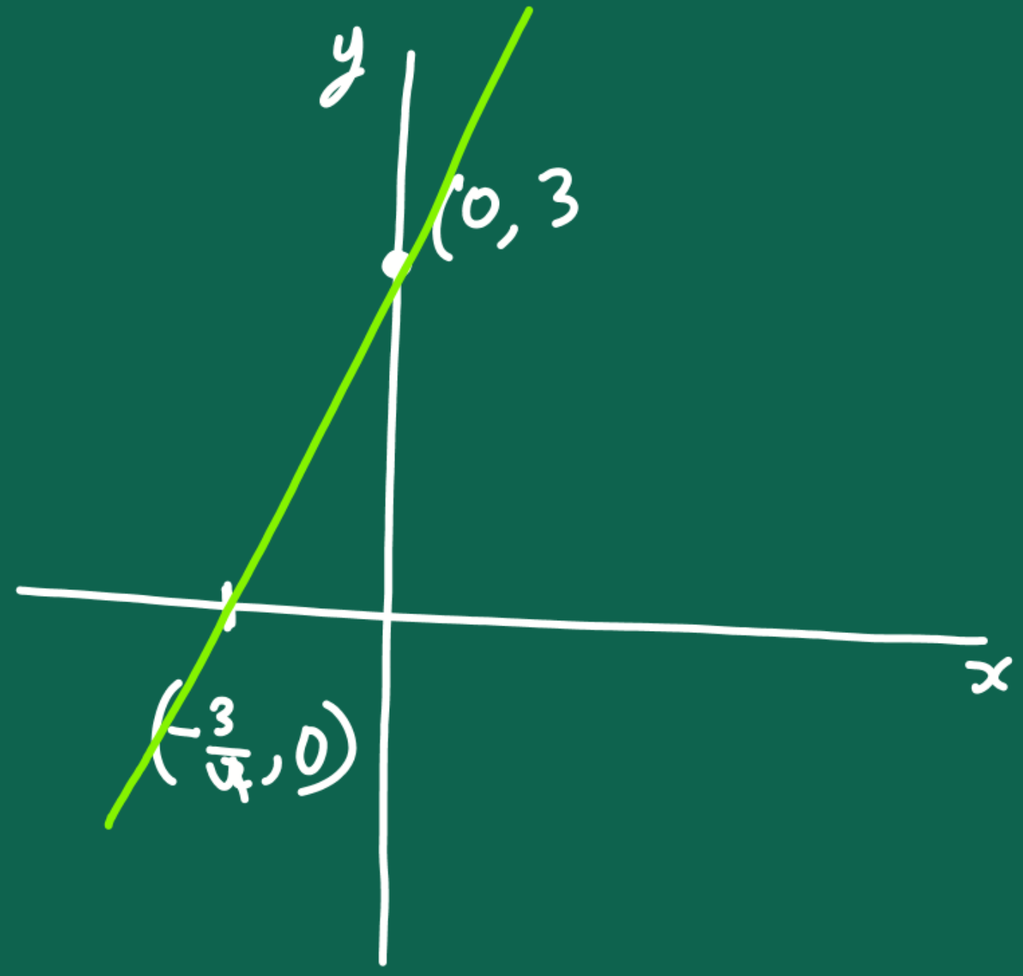
$$(x_1 - x_2)^2 = (x_2 - x_1)^2 = x_1^2 + x_2^2 + 2x_1x_2$$

$$y = mx + c$$

$$y = 4x + 3$$

i) $x = 0$; $y = 3$

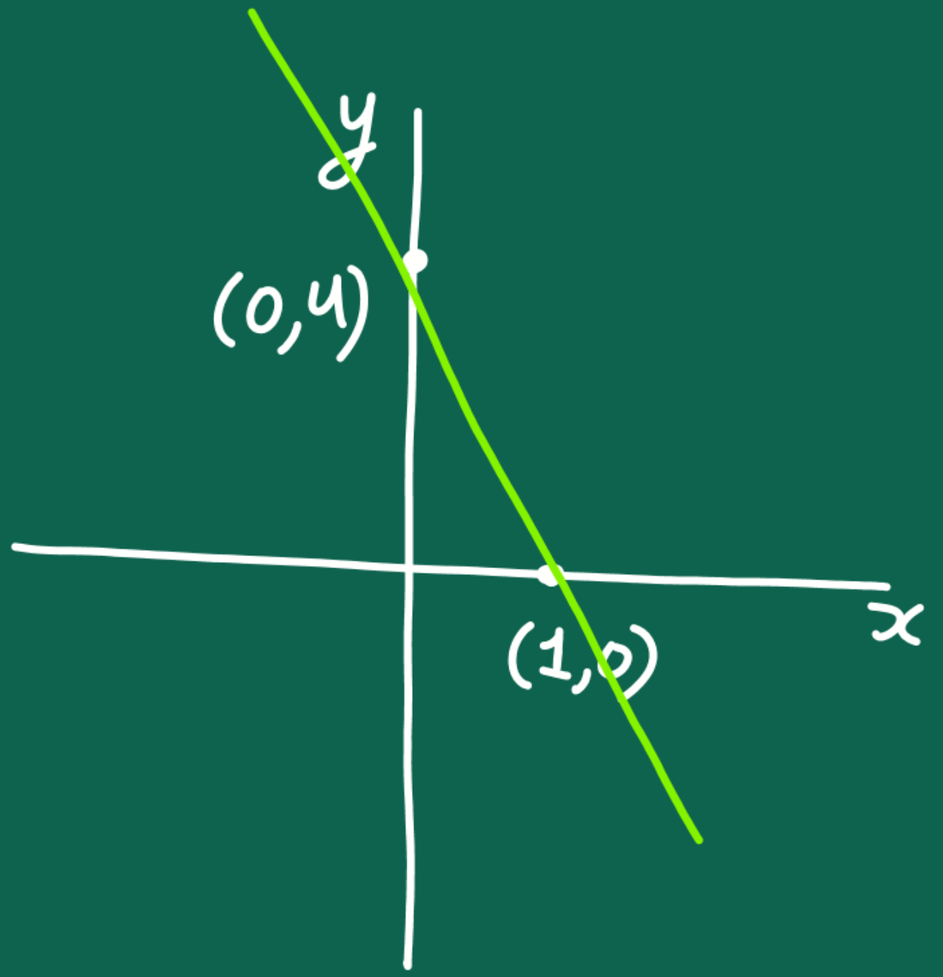
ii) $y = 0$; $x = -3/4$



$$y = -4x + 4$$

$x = 0 \; ; \; y = 4$

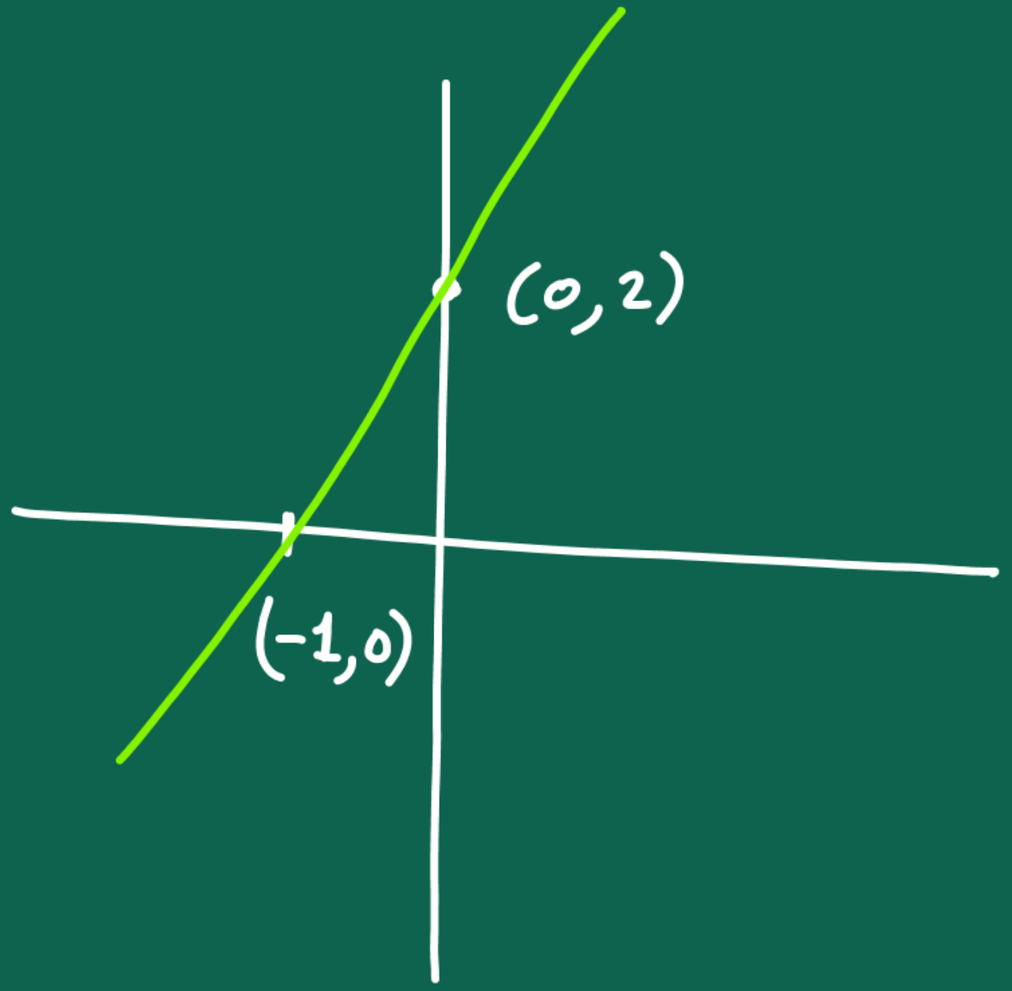
$y = 0 \; ; \; x = 1$



$$2y = 4x + 4$$

$x = 0 \; ; \; y = 2$

$y = 0 \; ; \; x = -1$



$$y = ax^2 + bx + c$$

if $a > 0$

if $a < 0$

if $a = 0 \Rightarrow$ S. line.

Q. $y = x^2 - 5x + 6$

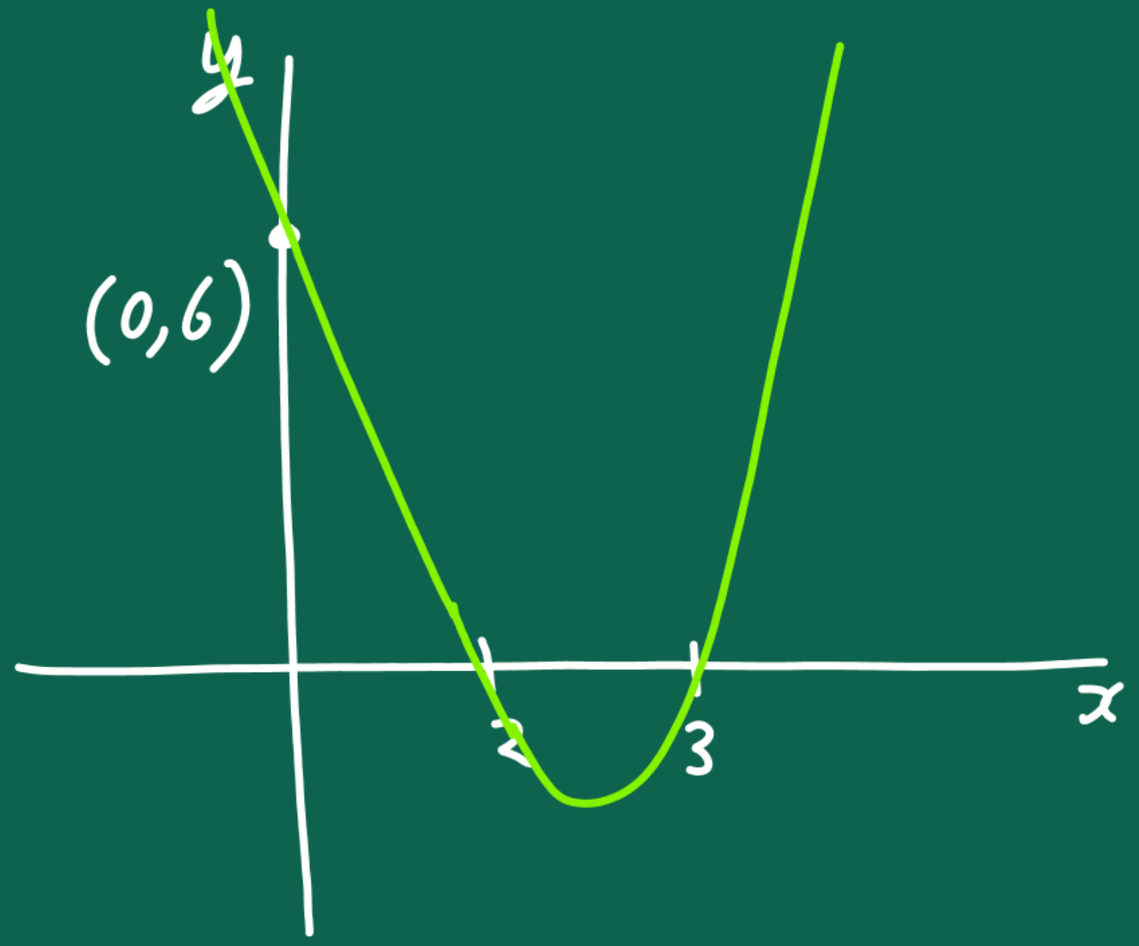
If $x = 0$; $y = 6$

If $y = 0$

$$x^2 - 5x + 6 = 0$$

$$(x-3)(x-2) = 0$$

$$x = 3, 2$$



$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

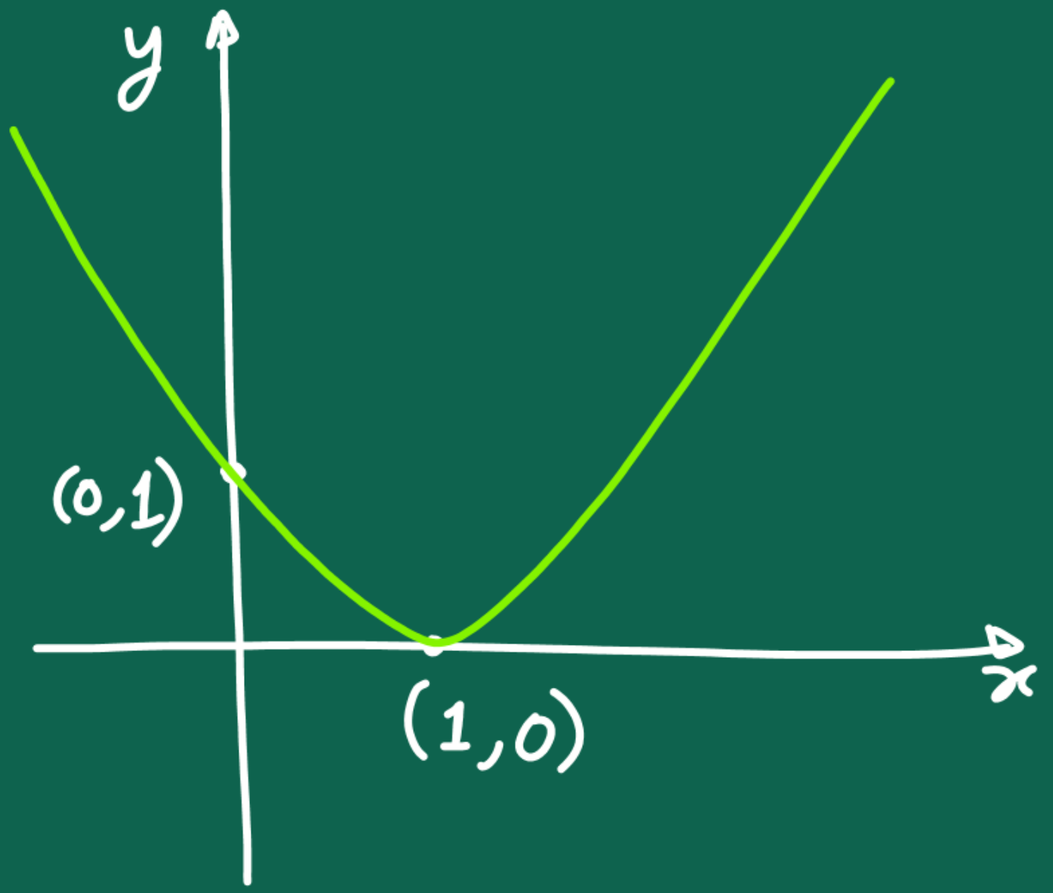
$$y = x^2 - 2x + 1$$

Si $x = 0$; $y = 1$

$y = 0$; $x^2 - 2x + 1 = 0$

$$(x-1)^2 = 0$$

$$x = 1$$



$$y = x^2 + 4x + 5$$

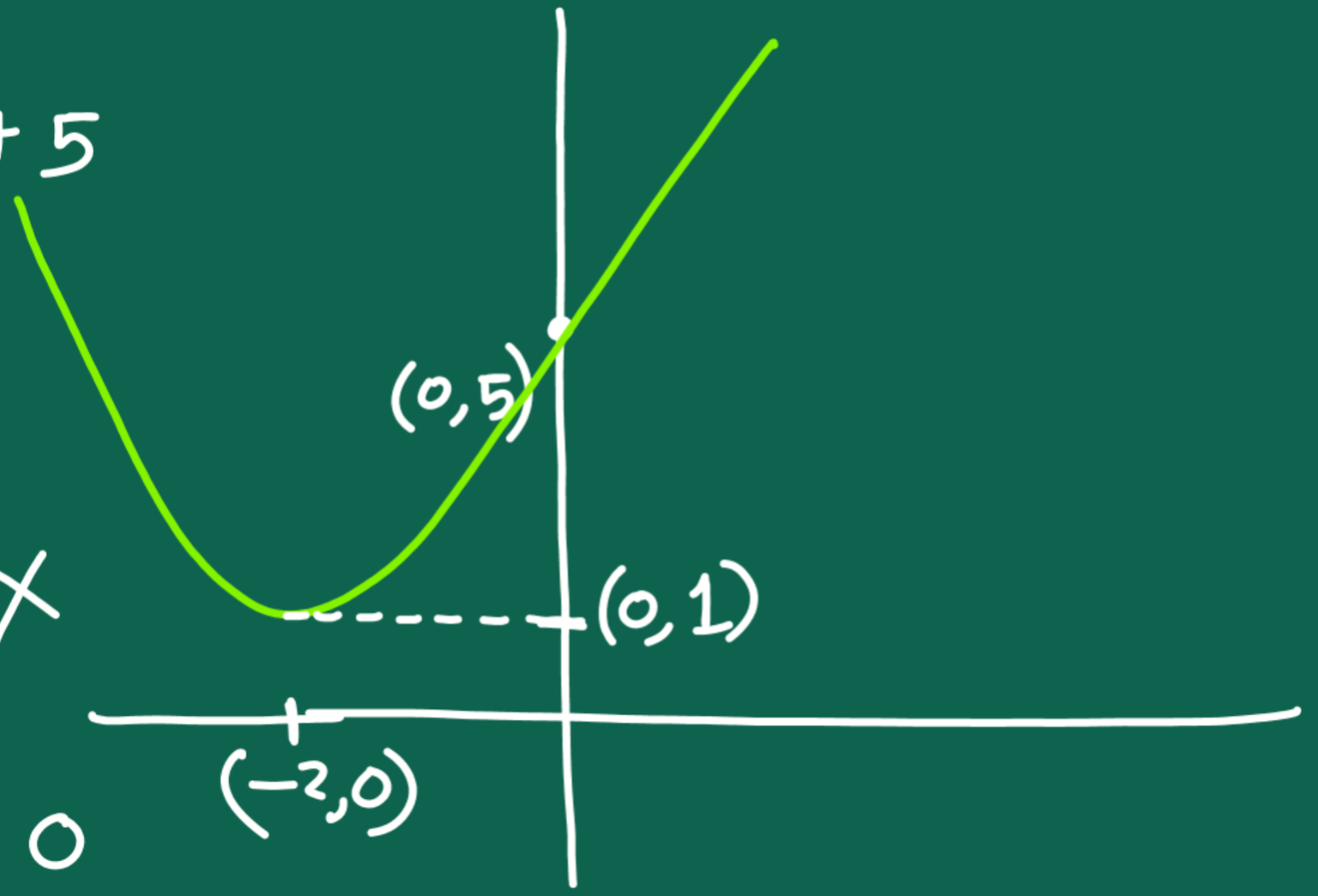
$x = 0 \; ; \; y = 5$

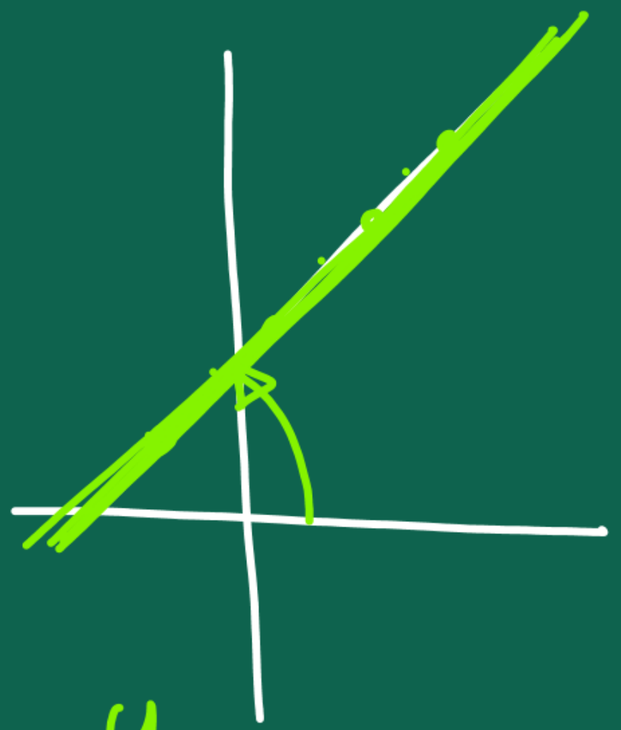
$y = 0 \; ; \; x = X$

$$\frac{dy}{dx} = 2x + 4 = 0$$

$$x = -2$$

$$y_{min} = (-2)^2 + 4(-2) + 5 = 1$$





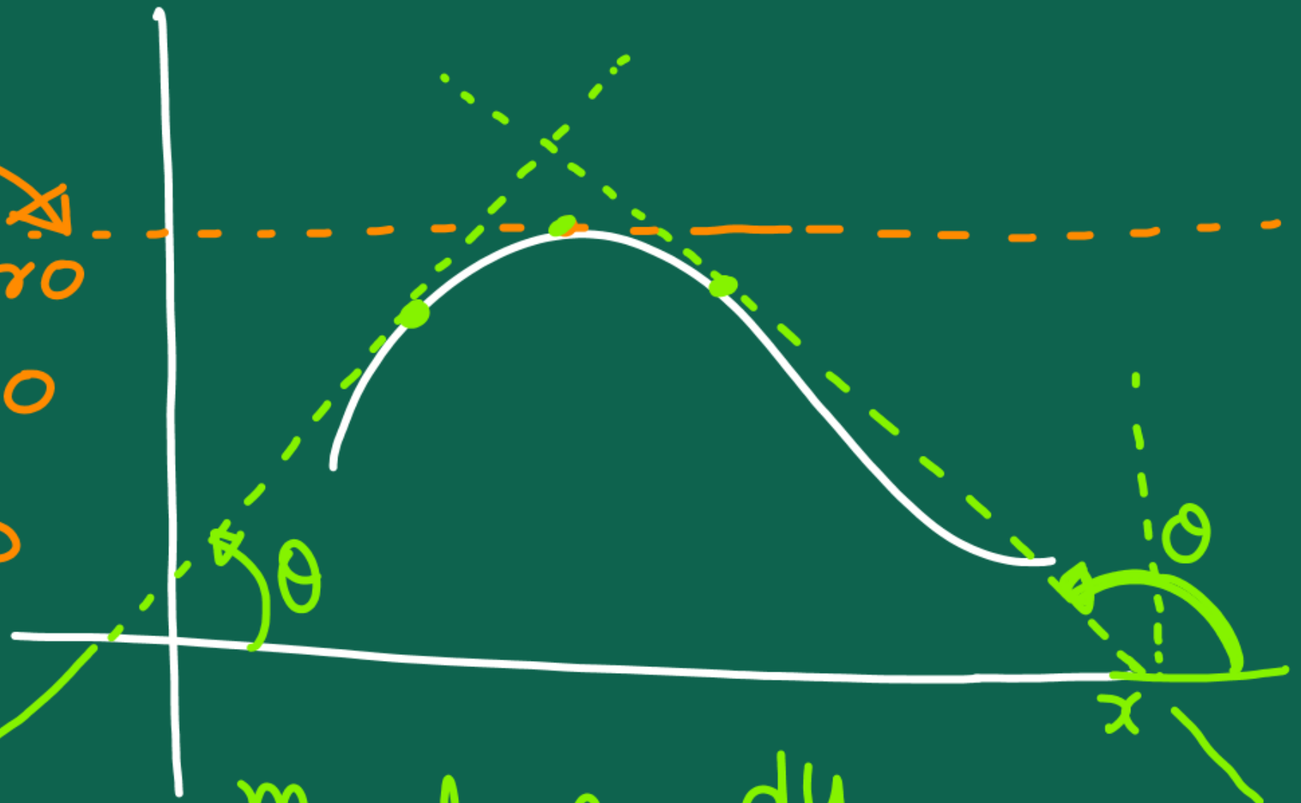
$y = mx + c$

$\frac{dy}{dx} = m$

$m = \text{Zero}$

$\tan\theta = 0$

$\frac{dy}{dx} = 0$



$m \to +ve$

$\tan\theta \to +ve$

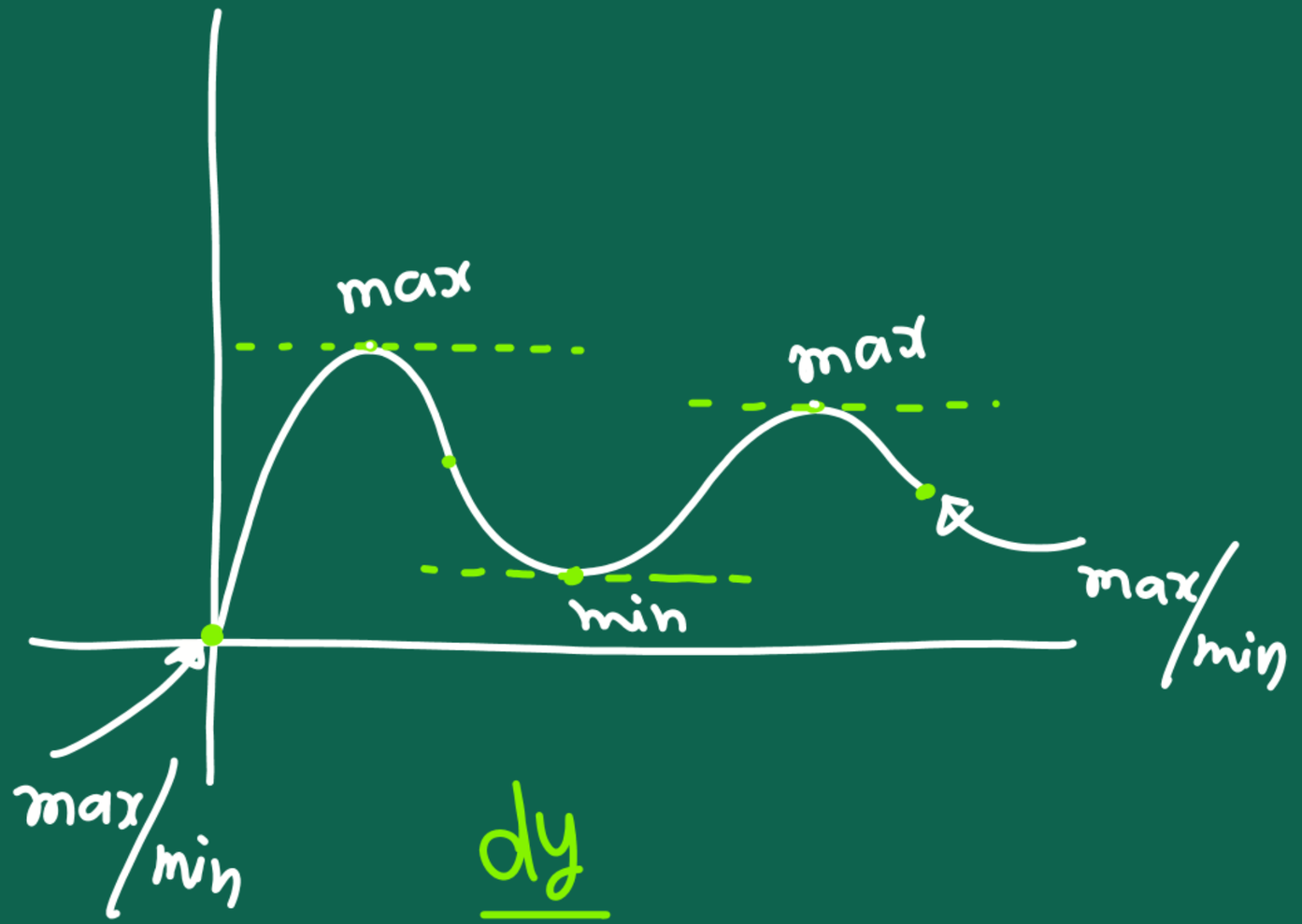
$0 < \theta < 90$

$m = \tan\theta = \frac{dy}{dx}$

$m \to -ve$

$\tan\theta \to -ve$

$90 < \theta < 180$



$$\frac{dy}{dx}$$

$$y = 9 - (x-3)^2$$

$$y = 9 - x^2 - 9 + 6x$$

$$y = -x^2 + 6x$$

$$\frac{dy}{dx} = -2x + 6 = 0$$

$$x = 3$$

$$\frac{d^2y}{dx^2} = -2 + 0 \Rightarrow -ve \Rightarrow max$$

$$y_{max}\Big|_{x=3} = 9$$

$$y = f(x)$$

$$\frac{dy}{dx} = 0$$

$$\frac{d^2y}{dx} \Rightarrow +ve \Rightarrow min$$

$$-ve \Rightarrow max$$

$$\int \sin x \, dx = -\cos x$$

$$\frac{d \sin 2x}{dx} = 2 \cos 2x$$

Q.10

$$\int \sin kx \, dx = -\frac{\cos kx}{k}$$

Q.6 ⇒ [b]

$$\int -\frac{1}{2} x^{-3/2}$$

$$= -\frac{1}{2} \int x^{-3/2}$$

$$= -\frac{1}{2} \cdot \frac{x^{-\frac{3}{2}+1}}{-\frac{3}{2}+1} = -\frac{1}{2} \cdot \frac{x^{-1/2}}{-1/2}$$

$$= x^{-1/2} = \frac{1}{\sqrt{x}}.$$

Q.8 ⇒ $\int 3 \sin x \, dx$

$= 3 \int \sin x \, dx$

$= 3(-\cos x)$

$= -3\cos x$

Ans $\Rightarrow$ $\int_{-2}^{4}\left(\frac{x}{2}+3\right)dx$

$= \int_{-2}^{4}\frac{x}{2}dx + \int_{-2}^{4}3dx$

$= \frac{1}{2}\left[\frac{x^2}{2}\right]_{-2}^{4} + 3\left[x\right]_{-2}^{4}$

$= \frac{1}{2}\left[\frac{4^2}{2}-\frac{(-2)^2}{2}\right] + 3\left[4-(-2)\right]$

$=$ ⌣⌣

Q.15 ⇒ $\int_{\sqrt{2}}^{5\sqrt{2}} x\,dx$

$= \left[\frac{x^2}{2}\right]_{\sqrt{2}}^{5\sqrt{2}}$

$= \left[\frac{(5\sqrt{2})^2}{2} - \frac{(\sqrt{2})^2}{2}\right] = \frac{50}{2} - \frac{2}{2} = 24$

Q.5 ⇒ [C]

$$\int \left(\sqrt[3]{x} + \frac{1}{\sqrt[3]{x}}\right) dx$$

$$\int \left((x)^{1/3} + x^{-1/3}\right) dx$$

$$\frac{x^{\frac{1}{3}+1}}{\frac{1}{3}+1} + \frac{x^{-\frac{1}{3}+1}}{-\frac{1}{3}+1}$$

$$= \frac{x^{4/3}}{\frac{4}{3}} + \frac{x^{2/3}}{2/3} = \frac{3}{4}x^{4/3} + \frac{3}{2}x^{2/3}$$