



# DSSSB TGT

## PART(B)



# MATHS

## MULTIVARIATE CALCULUS

Part -2



27/09/2024 08:00 AM



Area bounded by curve

⑧  $y^2 = 4ax$  and  $x^2 = 4by$ .

$$\text{Area} = \frac{16}{3} ab$$

Ques  $y = \sqrt{x}$  and  $x = \sqrt{y}$  then find the area between these curve.

$$\downarrow$$
$$y^2 = x$$

$$4a = 1$$

$$a = \frac{1}{4}$$

$$\downarrow$$
$$x^2 = y$$

$$4b = 1$$

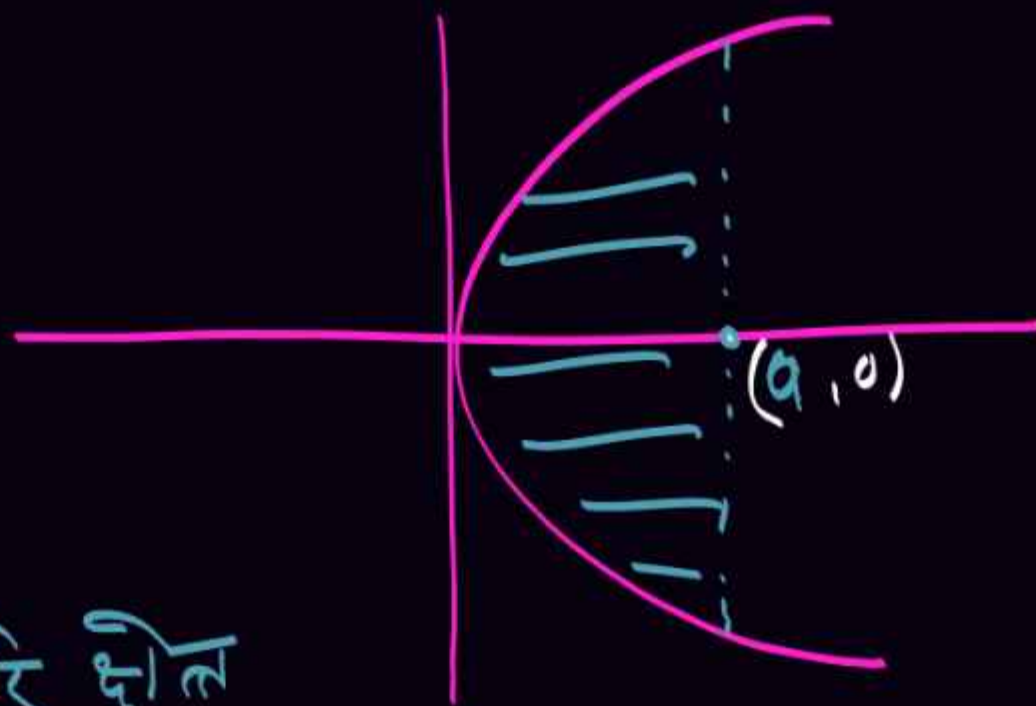
$$b = \frac{1}{4}$$

$$\text{Area} = \frac{16 \times \frac{1}{4} \times \frac{1}{4}}{3} = \frac{1}{3}$$



#  $y^2 = 4ax$  व इसके समिलम्ब से- धिए को

$$\text{Area} = \frac{8}{3} a^2$$



Ques  $y^2 = 4Kx$  और इसके समिलम्ब द्वारा धिए क्षेत्र का क्षेत्रफल 24 की निम्ति है- तो  $K = ?$

$$4a = 4K$$

$$a = K$$

$$\text{Area} = 24$$

$$\frac{8}{3} \times K^2 = 24$$
$$K^2 = 9$$
$$\boxed{K = 3}$$

## # Circle

$$\text{Area} = \pi a^2$$

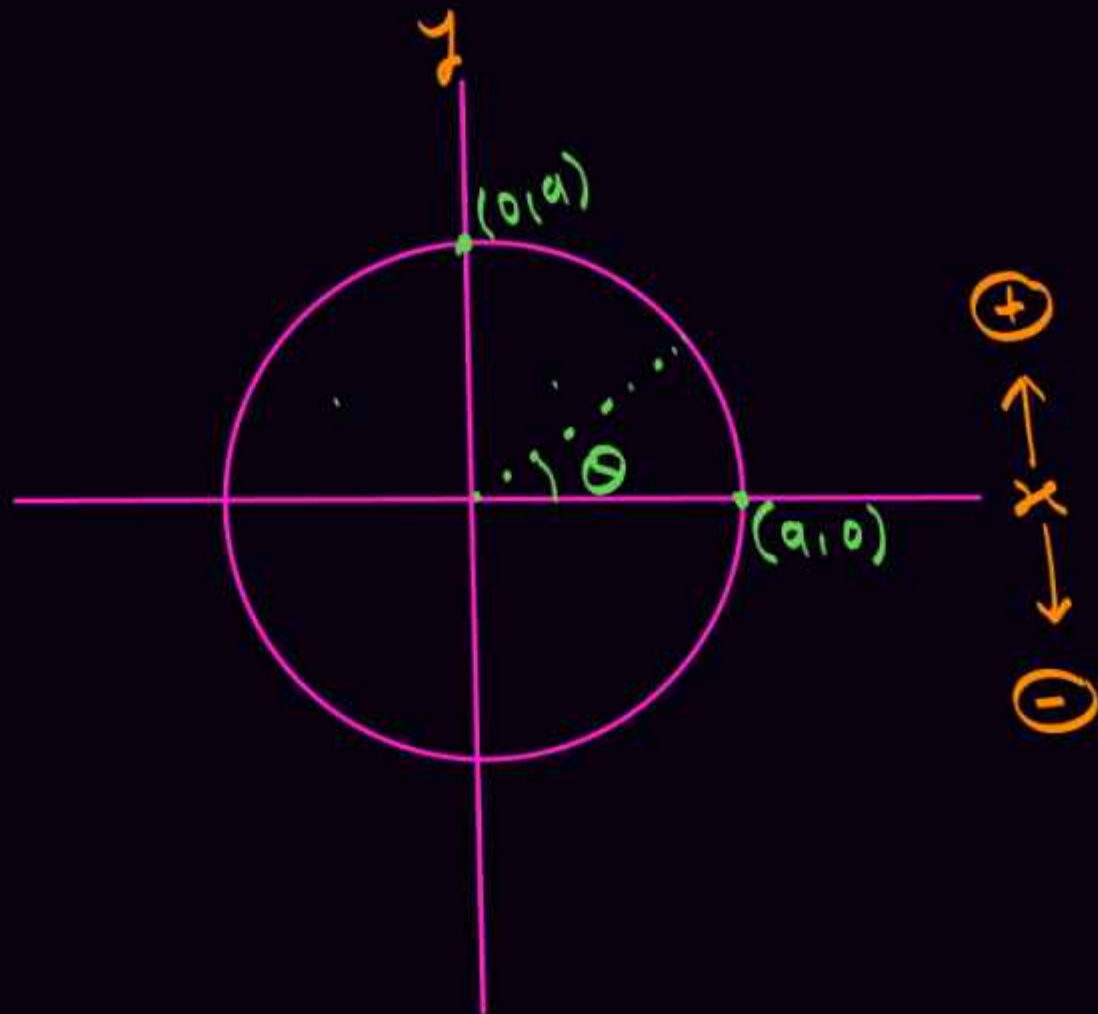
$$\text{Area of Sector} \Rightarrow \frac{\theta}{2} \times a^2$$

Area of 1 quadrant

$$\Rightarrow \frac{\pi a^2}{4}$$

$$\text{Area of positive sector} \Rightarrow \frac{\pi a^2}{2}$$

↑  
negative

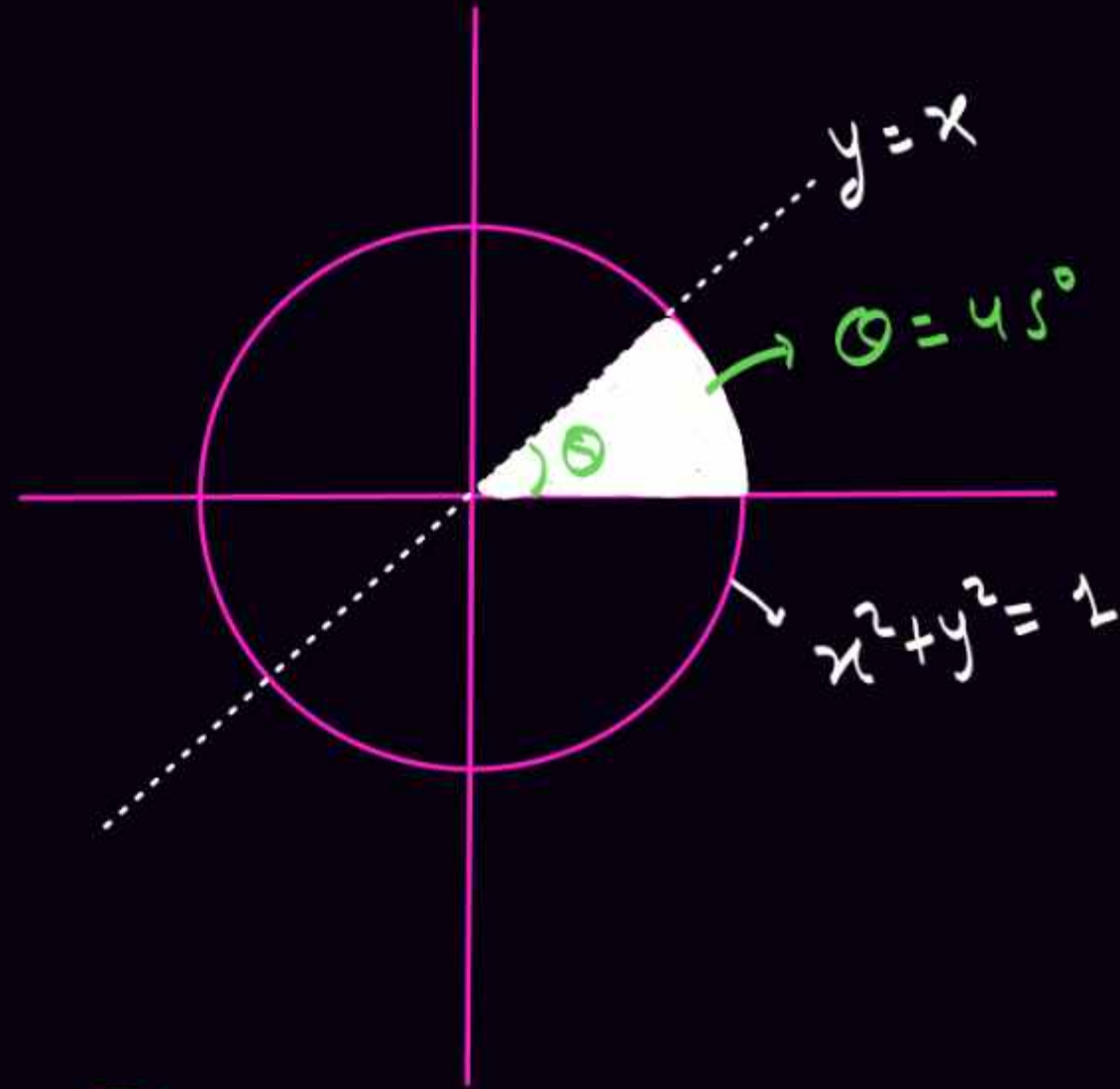


Ques  $y = \sqrt{1-x^2}$ ,  $y=x$  ले घिरे क्षेत्र का क्षेत्रफल बताओ -

$$\downarrow$$
$$y^2 = 1 - x^2$$
$$x^2 + y^2 = \textcircled{1} \text{ (circle)}$$

$\downarrow$   
 $a^2$

Radius  $\boxed{a=1}$



$$\text{Area} \Rightarrow \frac{45^\circ}{2} \times 1$$

$$\Rightarrow \frac{45}{2} \Rightarrow \frac{\pi}{4} \times 2 = \textcircled{\frac{\pi}{2}}$$

Ques  $y = \sqrt{16-x^2}$ ,  $y \geq 0$ , જો  $x$  મહત્ત્વ આપ દિવા જોતો ના મોતફતલ —

$$\downarrow$$
$$y^2 = 16 - x^2$$

$\downarrow$   
Area ④

$$x^2 + y^2 = 16$$

$$\downarrow$$
$$\boxed{a=4}$$

Area of positive sector.

$$\Rightarrow \frac{\pi a^2}{2}$$

$$\Rightarrow \frac{\pi 16}{2}$$

$$= 8\pi$$



Ques  $x = \sqrt{3}y$  ,  $x^2 + y^2 = 4$  दोनो से दिये गये हट गो =

$$\downarrow$$
$$y = \frac{x}{\sqrt{3}}$$

$$\downarrow$$
$$a = 2$$

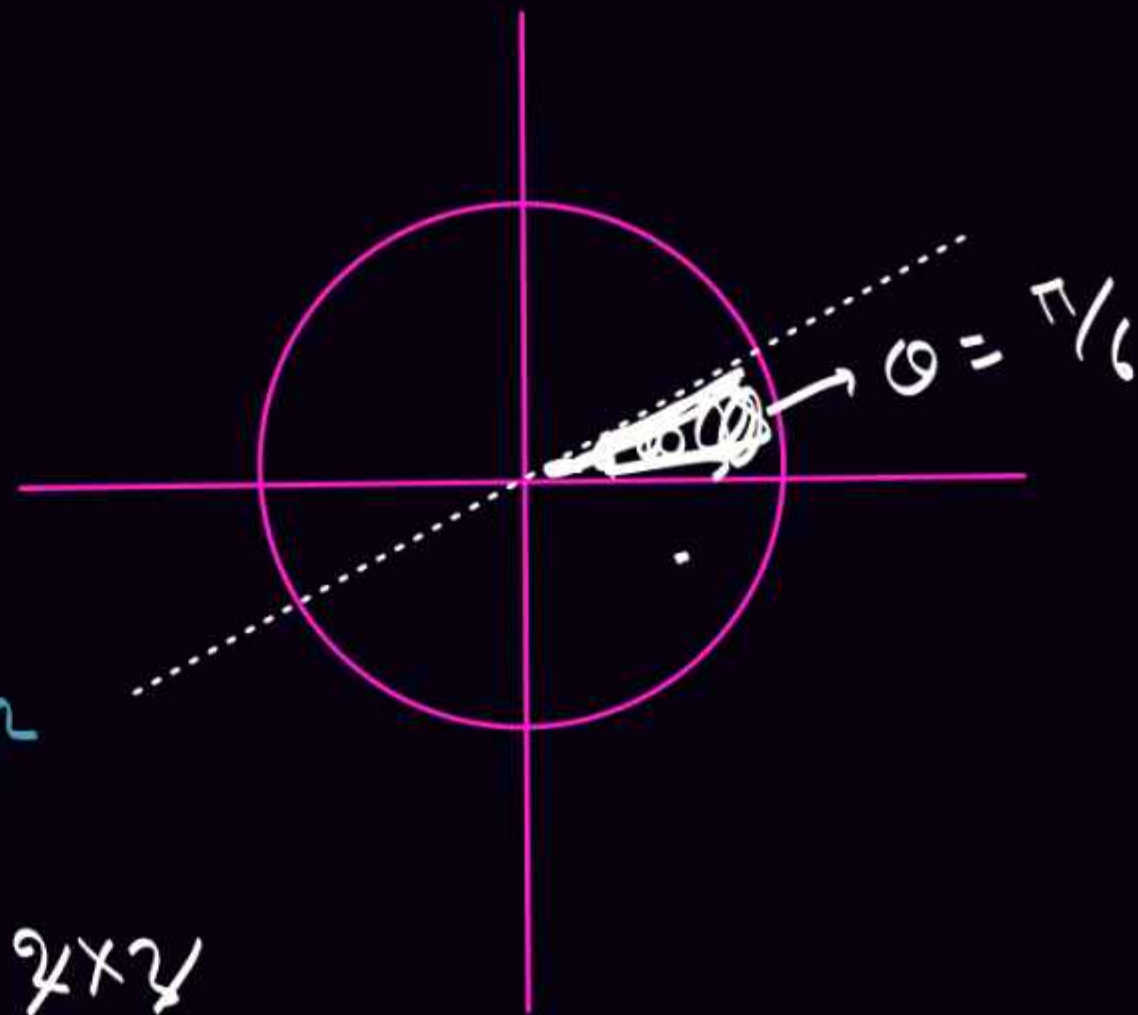
$$m = \frac{1}{\sqrt{3}}$$

$$\tan \theta = \frac{1}{\sqrt{3}}$$

$$\theta = \frac{\pi}{6}$$

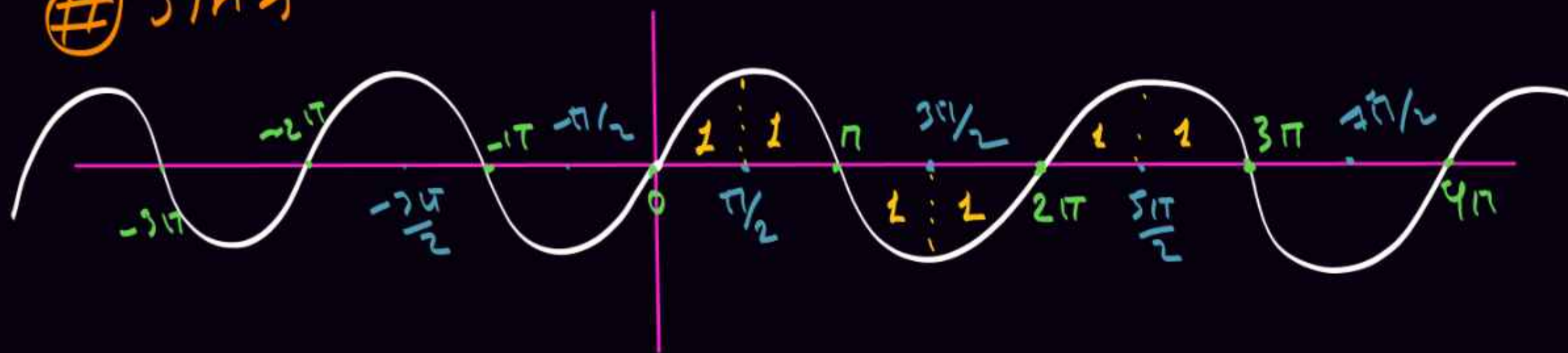
$$\text{Area of sector} = \frac{\theta}{2} \cdot a^2$$

$$= \frac{\pi}{6 \times 2} \times 2 \times 2$$
$$= \frac{\pi}{3}$$

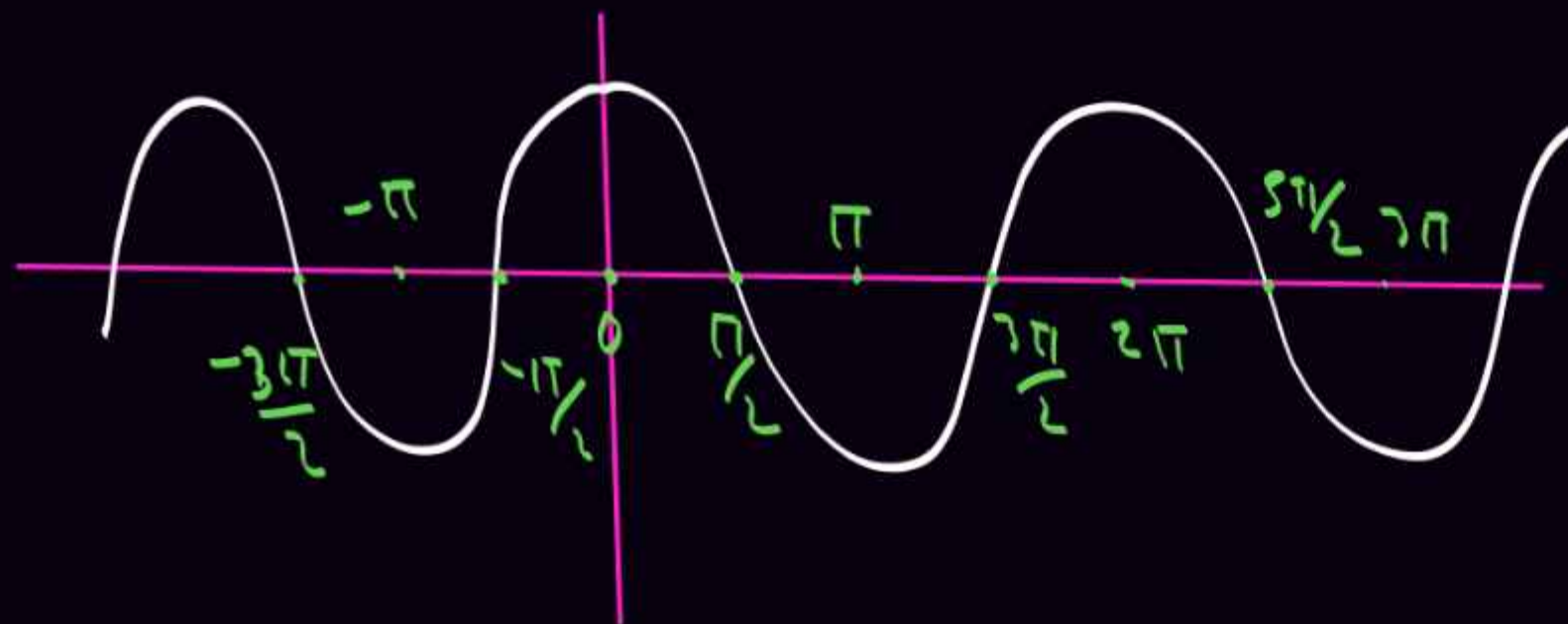




⊕  $\sin x$

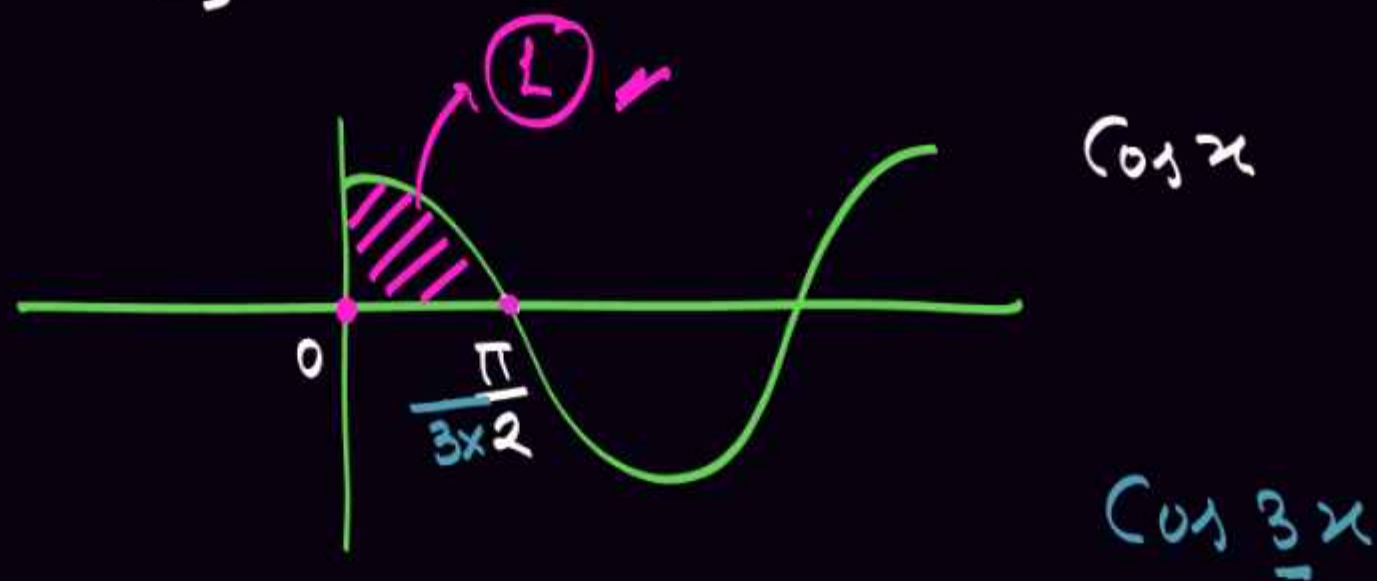


⊕  $\cos x$



Ques  $y = \cos 3x$  ,  $0 \leq x \leq \pi/6$   
 $\downarrow$   
 $[0, \pi/6]$

Area = 1 unit



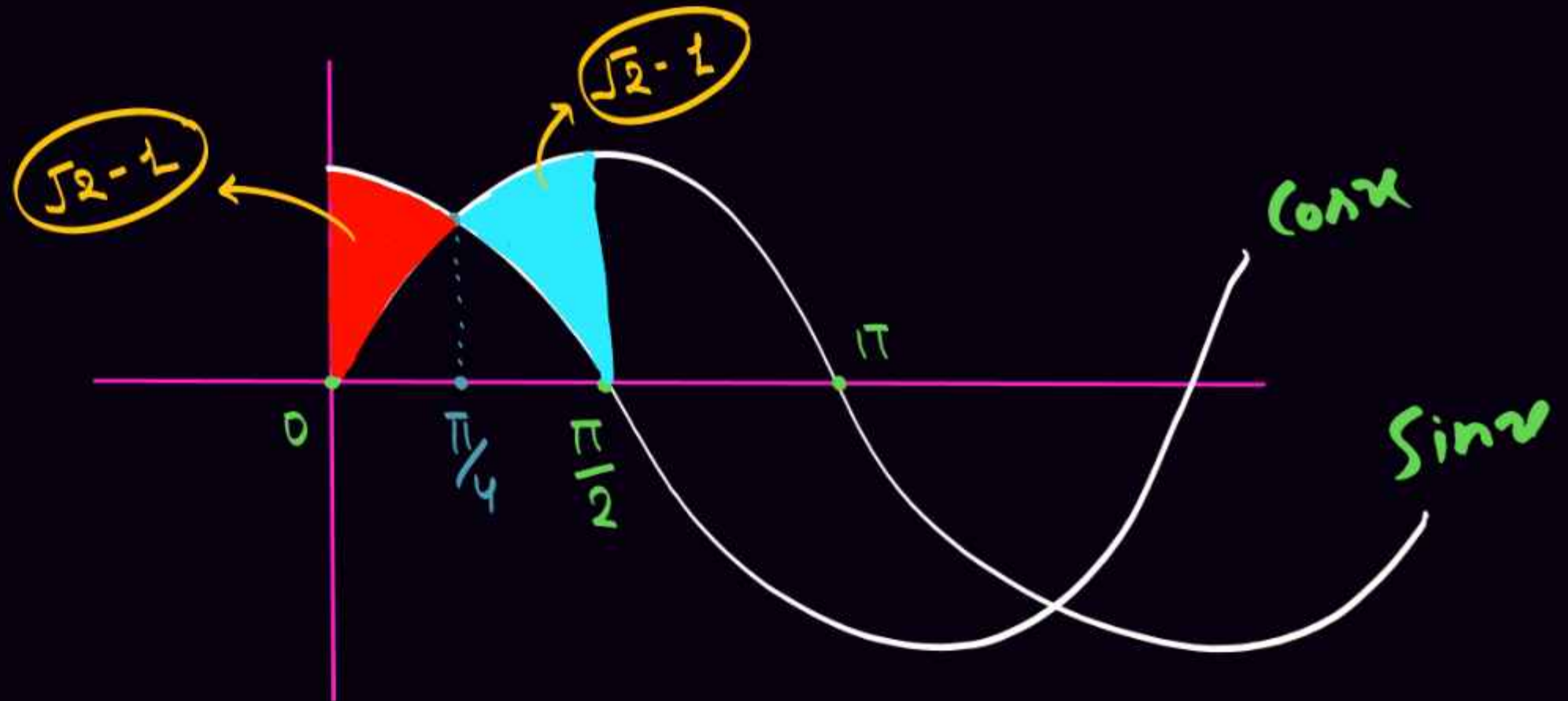
Ques  $y = \sin x$ ,  $y = \cos x$ ,  $x=0$  ते  $x = \pi/4$  पर घेरा गेले हा गोलमाल -

$$\int_0^{\pi/4} (\cos x - \sin x) dx$$

$$[\sin x + \cos x]_0^{\pi/4}$$

$$\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} - 1$$

$$\sqrt{2} - 1$$

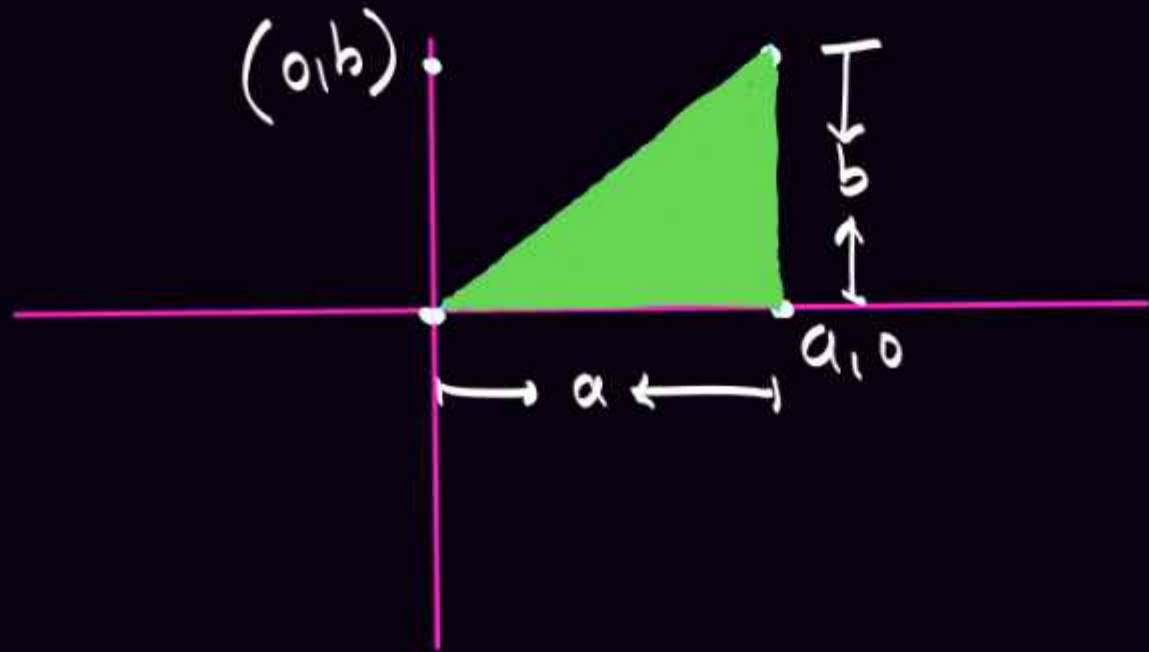


$$\left. \begin{array}{l} 0 \rightarrow \pi/4 \Rightarrow \\ \pi/4 \rightarrow \pi/2 \Rightarrow \end{array} \right\} \sqrt{2} - 1$$

$$0 \rightarrow \pi/2 \Rightarrow 2(\sqrt{2} - 1)$$



(#)  $\frac{x}{a} + \frac{y}{b} = 1$  के निदेशांक अक्षों द्वारा घेरे गोल का क्षेत्रफल -



$$\text{Area} = \frac{1}{2} \times \text{Base} \times \text{height}$$

$$\text{Area} = \frac{ab}{2}$$

Ques  $x+y+2=0$  ,  $x=0$  ,  $y=0$  से घिटा त्रैभुज का —

$$x+y=-2$$

$$\underbrace{\frac{x}{-2}}_a + \underbrace{\frac{y}{-2}}_b = 1$$

$$\text{Area} \Rightarrow \frac{a \times b}{2} \Rightarrow \frac{-2 \times -2}{2} \Rightarrow 2 //$$