YAKEEN NEET 2.0

2026

Vectors

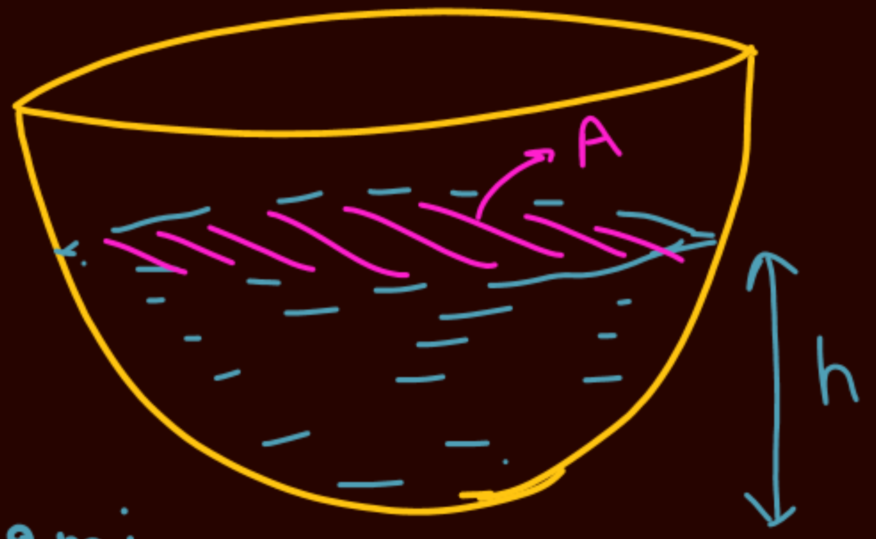
PHYSICS | Lecture -01

By - Saleem Ahmed Sir

Todays Goal

— Vector (Introduction)

— Integration



$$\frac{d\,vol}{dt} = A\frac{dh}{dt} \propto A$$

$$\cancel{A}\frac{dh}{dt} = K\cancel{A}$$

$$\boxed{\frac{dh}{dt} = Const \rightarrow -ve}$$

$h=10 \xrightarrow{2min} h=5 \xrightarrow[t=\ ]{} h=2.5$

$h=10 \xrightarrow{3min} h=6m \longrightarrow h=4m$

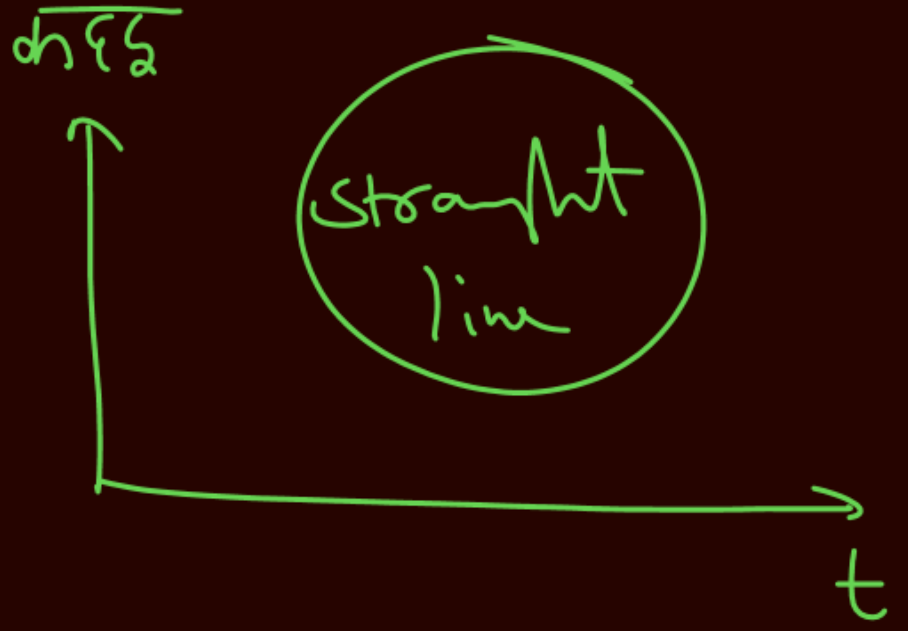
$$\frac{dh}{dt} = -K$$

$4m \longrightarrow 3\,min$

$1 \longrightarrow \frac{3}{4}$

$2m \quad \_\_ \quad \frac{3}{4}\times 2$

$$\frac{d\,\overline{\text{कद्दू}}}{dt} = \text{Const}$$



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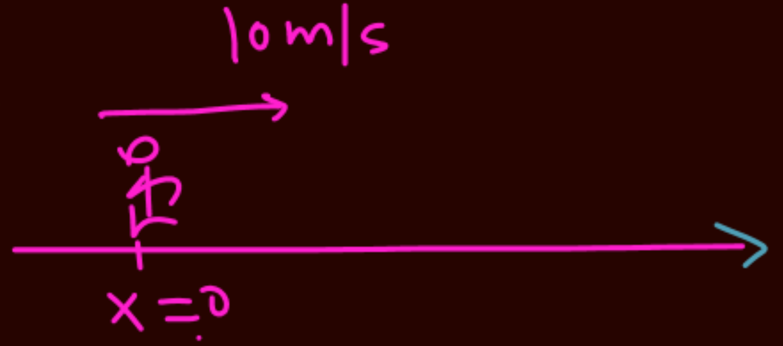
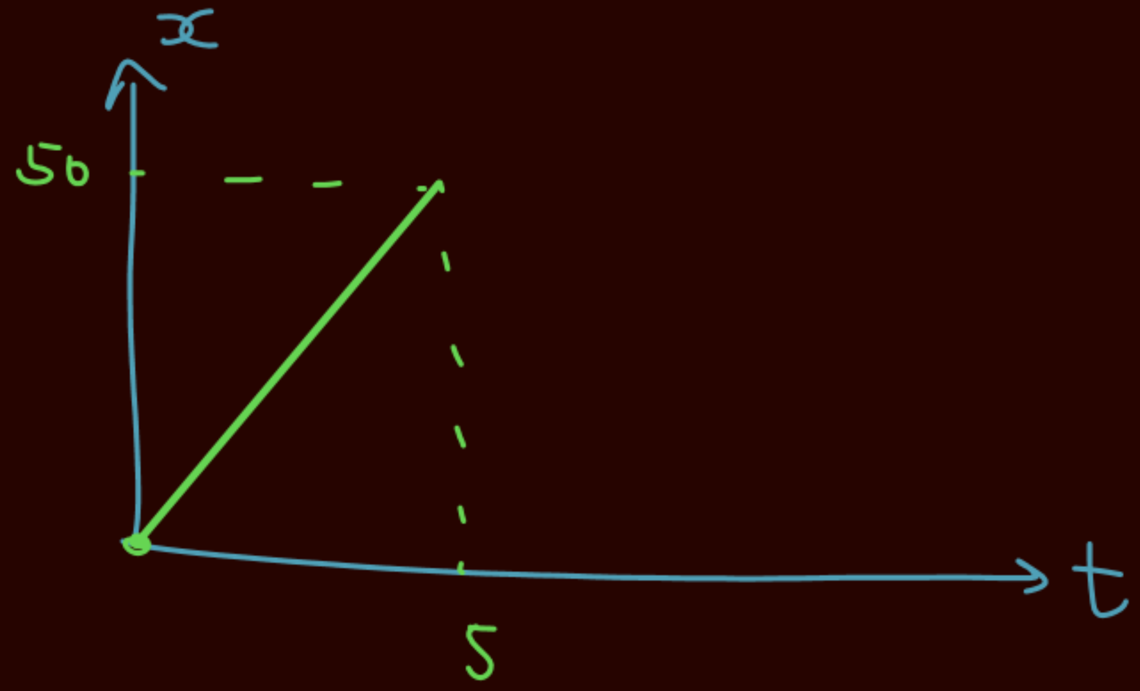
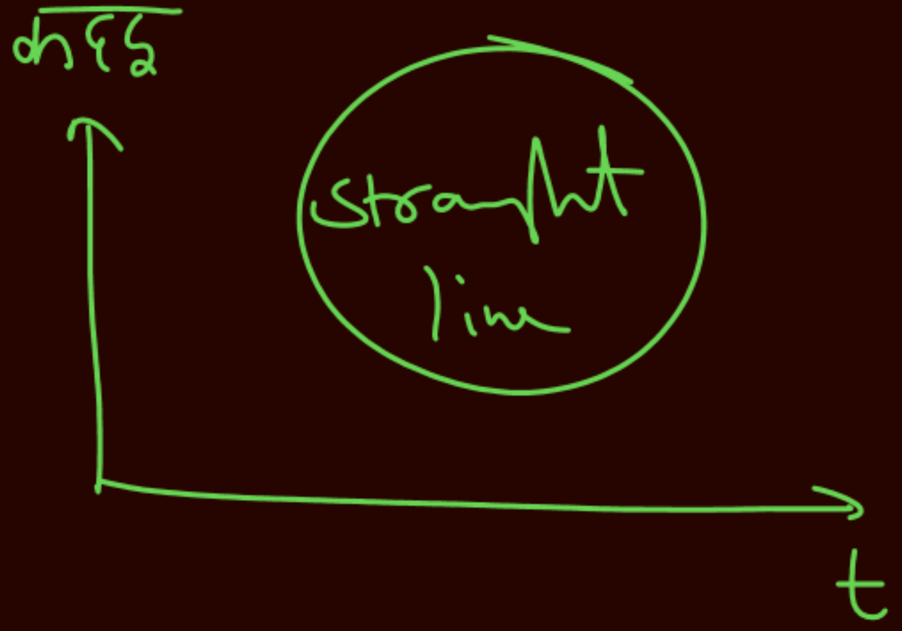


$v = 10\ m/s$

$$\frac{dx}{dt} = 10$$



$$\frac{d\,\overline{\text{कद्दू}}}{dt} = \text{Const}$$



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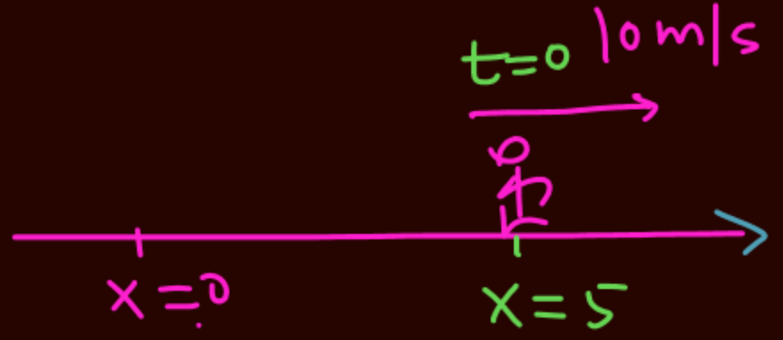
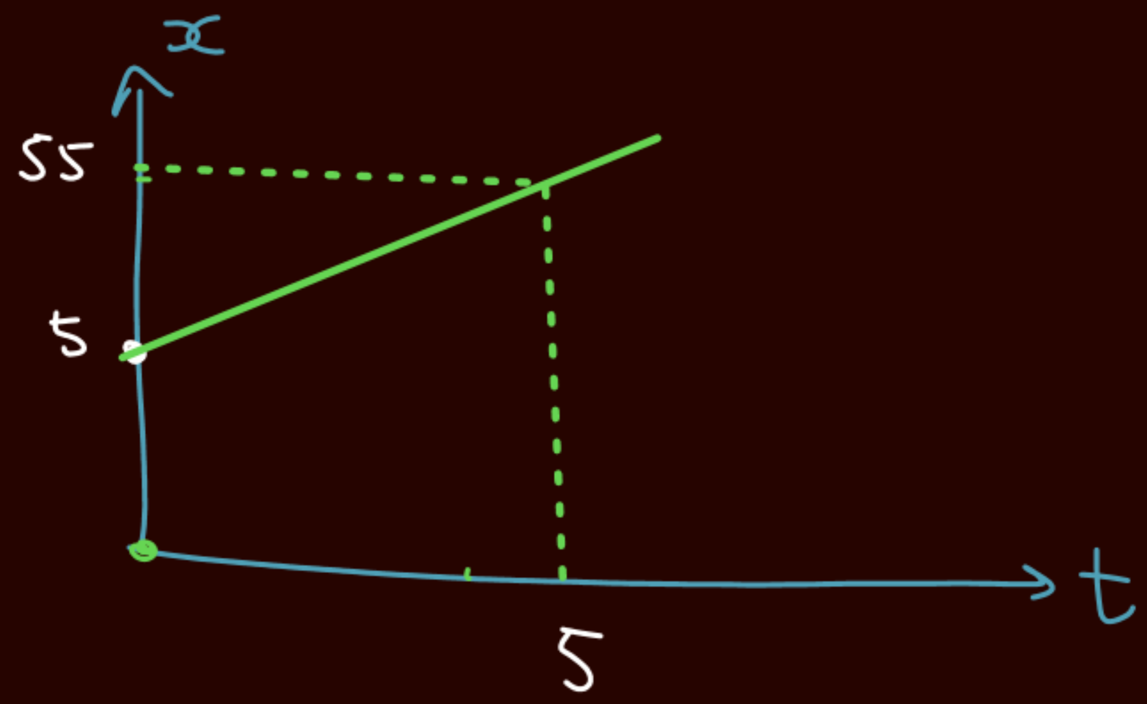


$$v = 10 \text{ m/s}$$

$$\frac{dx}{dt} = 10$$



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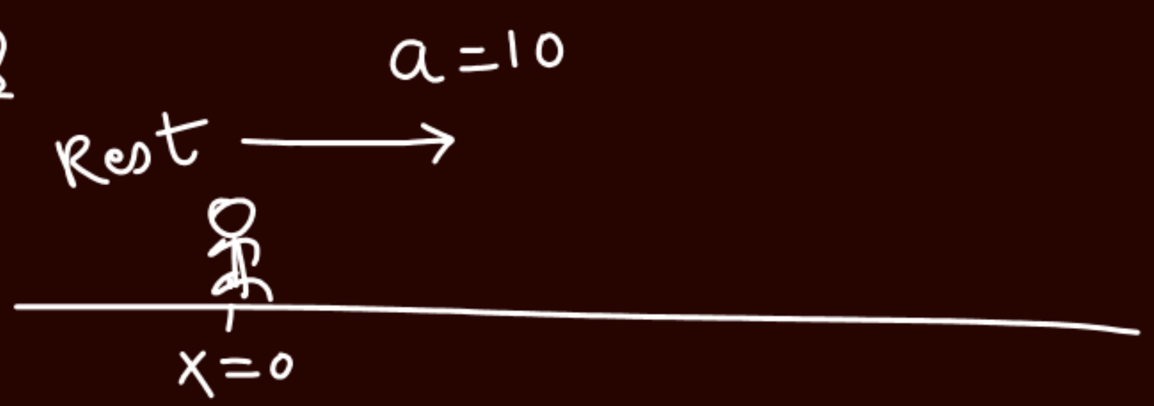
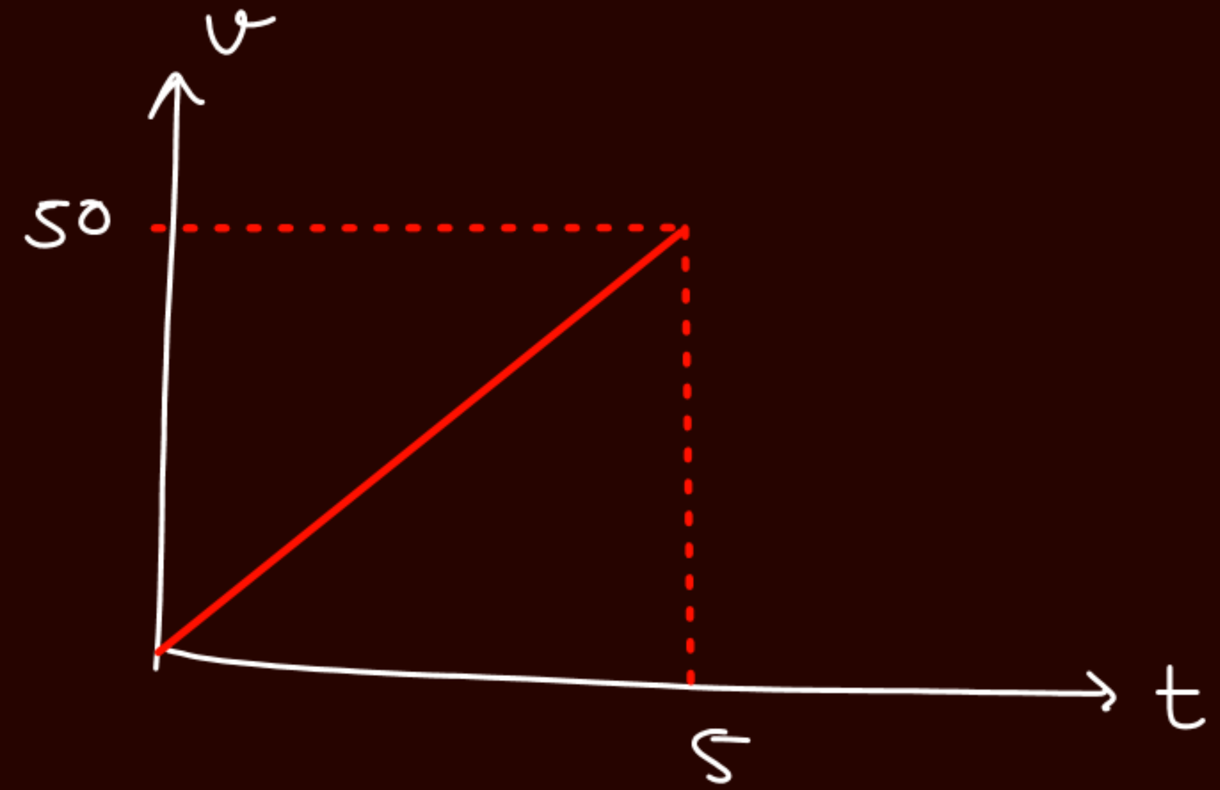


$$a = \frac{dv}{dt} = 10 = \text{const}$$



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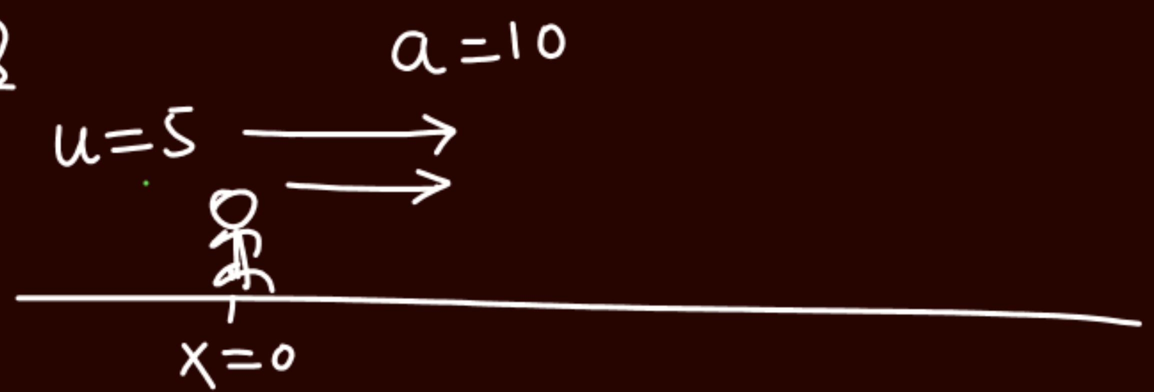
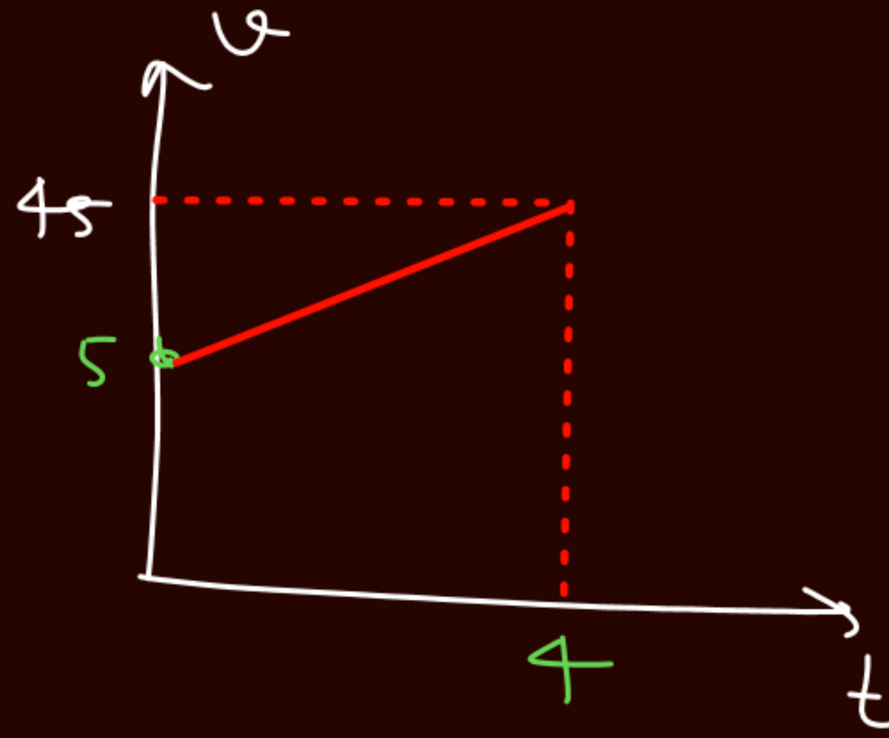


t= 6 sec

$$v = u + at$$
$$= 5 + 10 \times 6$$
$$\boxed{v = 65}$$



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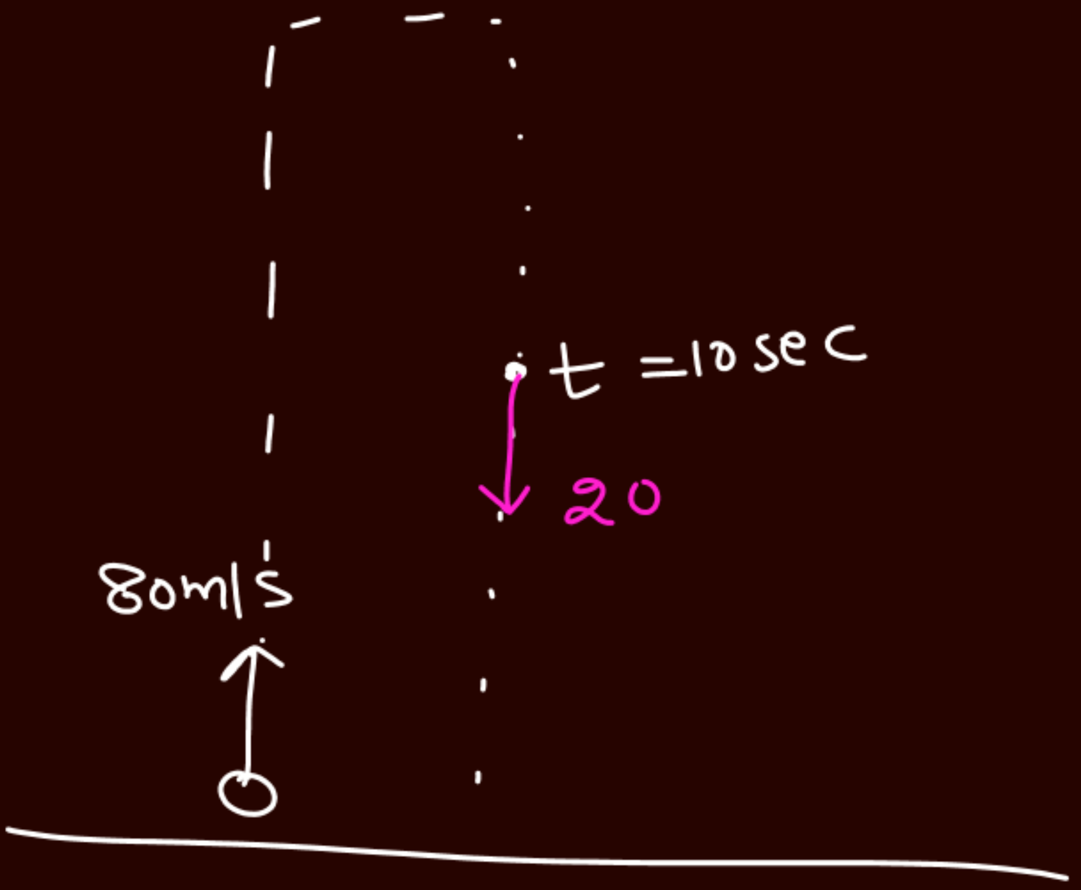
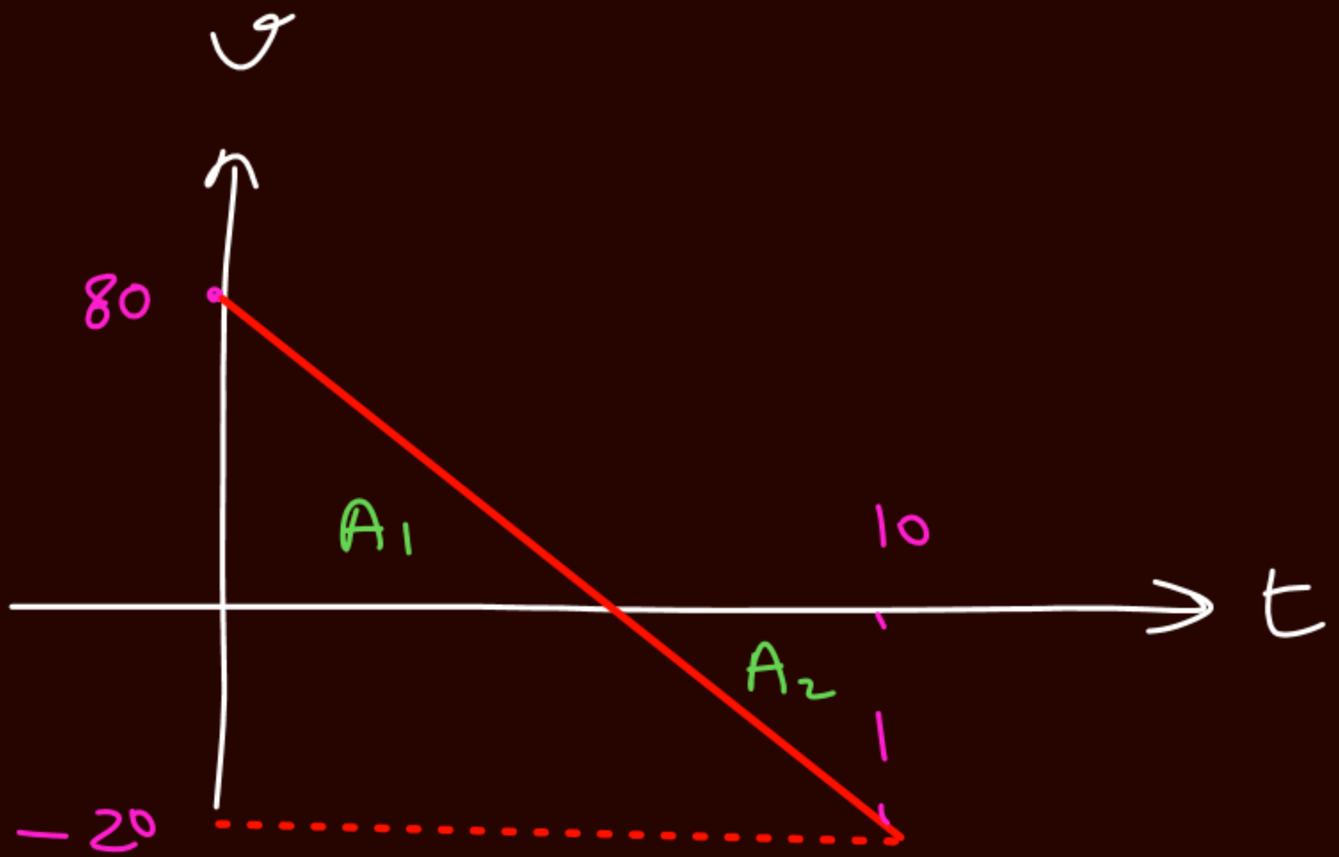
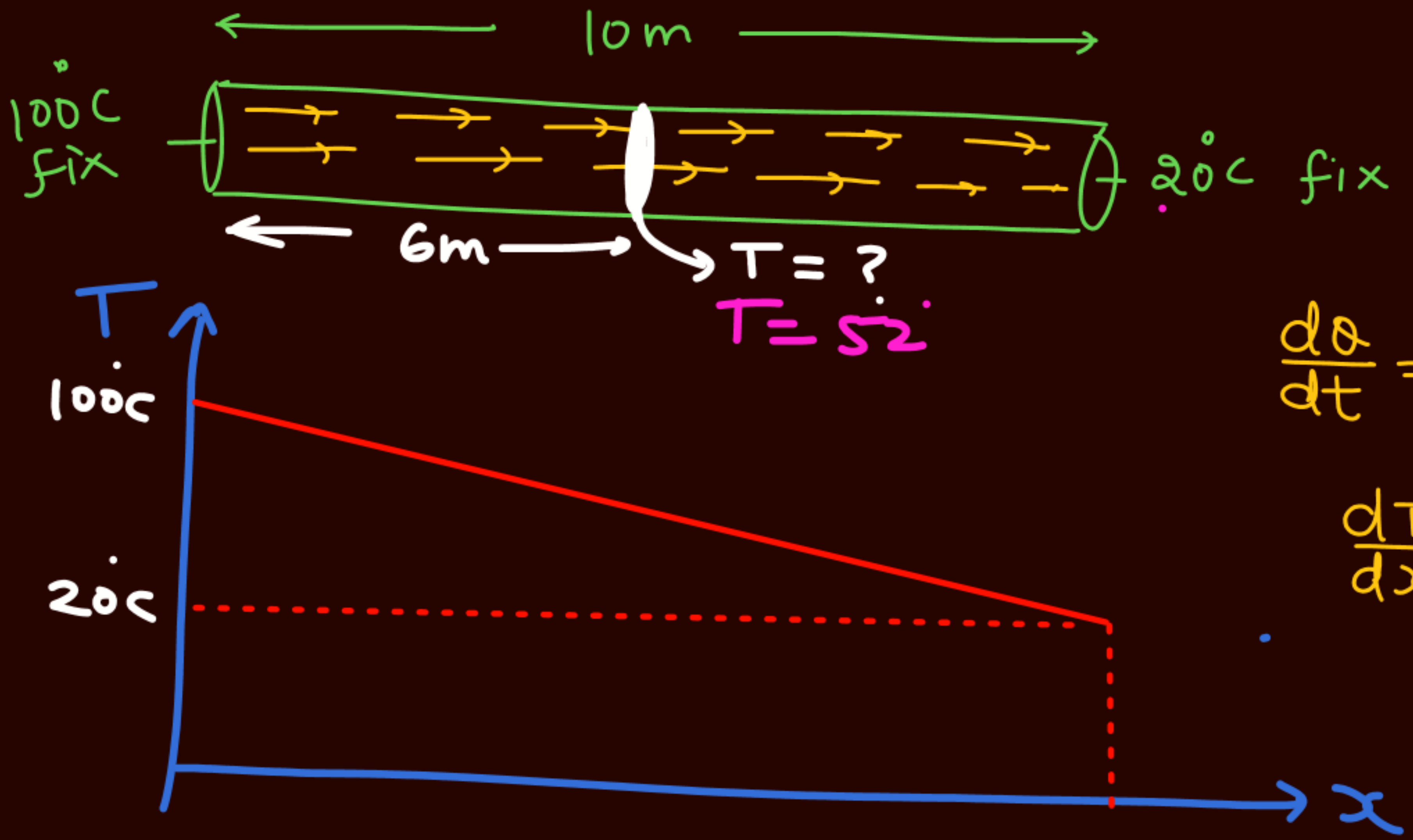


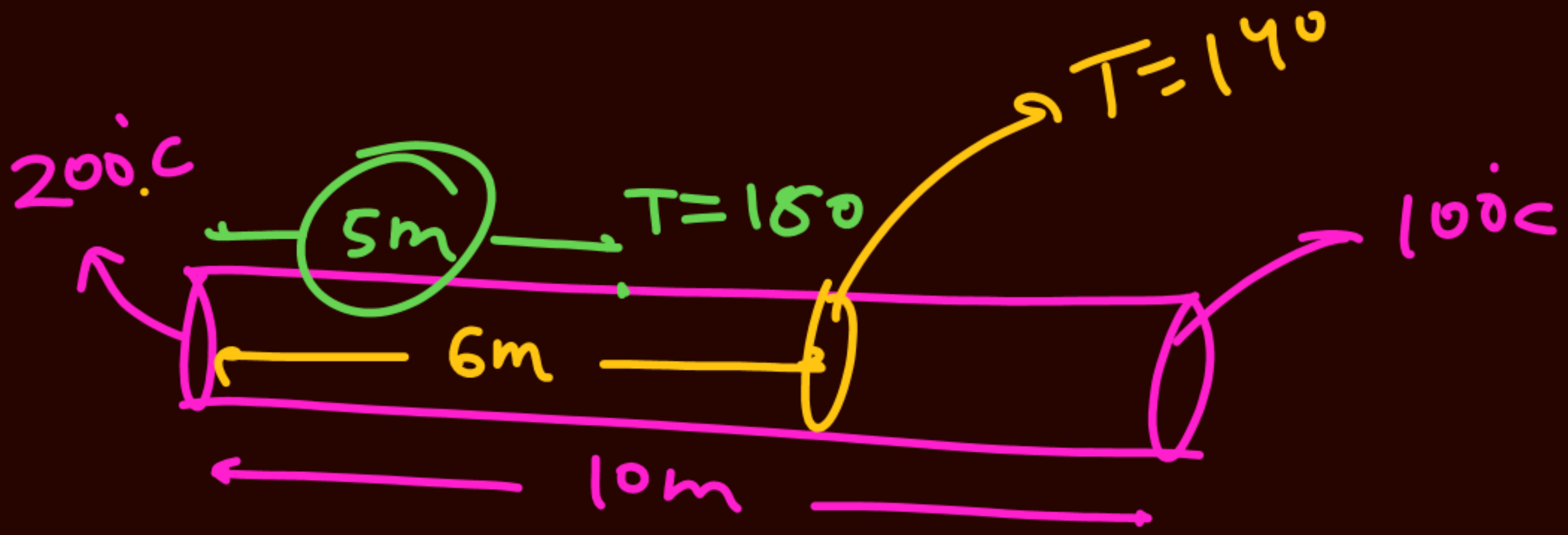


acc = 10 (Neeche)



$$\frac{dQ}{dt} = i = -KA\frac{dT}{dx}$$

$$\frac{dT}{dx} = -\frac{i}{KA} = -(\text{Const})$$



10m $\longrightarrow$ 100 का

1 $\longrightarrow$ 10

$$\frac{d\,\overline{\text{कदर}}}{dt} = \text{const}$$

$$\frac{d\,\overline{\text{कदर}}}{dx} = \text{const}$$

#

$$y = \sin x + e^x + x^6$$

$$\int y\,dx = -\cos x + e^x + \frac{x^7}{7} + C$$

Q

$$\int \frac{\sqrt{x}}{x}\,dx = \int \frac{1}{\sqrt{x}}\,dx$$

$$= \int x^{-\frac{1}{2}}\,dx = \frac{x^{-\frac{1}{2}+1}}{-\frac{1}{2}+1} + c$$

$$= 2\sqrt{x} + c$$

Definite integration

Q $y = x^2$

find $\int y\,dx$ from $x=0$ to $x=2$

Sol^n $$\int y\,dx = \int_{x=0}^{x=2} x^2\,dx = \left.\frac{x^3}{3}\right|_{x=0}^{x=2} = \frac{2^3}{3} - \frac{0^3}{3} = \frac{8}{3}$$

Q $\int_0^1 x^3 \, dx$

$= \left. \frac{x^4}{4} \right|_0^1$

$= \frac{1^4}{4} - 0 = \frac{1}{4}$

Q $\int_0^2 6x^5 \, dx$

$= \left. 6\frac{x^6}{6} \right|_0^2$

$= 2^6 - 0$

$= 64$

Q $\int_0^1 (x^2 + x^3) \, dx$

Sol^n $\left. \left(\frac{x^3}{3} + \frac{x^4}{4} \right) \right|_0^1$

$= \left(\frac{1}{3} + \frac{1}{4} \right) - \left(\frac{0}{3} + \frac{0}{4} \right)$

$= \frac{7}{12}$

Q $y = x^3$

find area between curve and x-axis from $x=1$ to $x=4$

Sol^n

$$\int_1^4 x^3\,dx = \left.\frac{x^4}{4}\right|_{x=1}^{x=4} = \frac{4^4}{4} - \frac{1^4}{4} =$$

$$= 64 - \frac{1}{4} =$$

$$= \frac{255}{4}$$

Q $\int_0^{\pi/2} \sin x \, dx$

$= (-\cos x)\Big|_0^{\pi/2}$

$= -(\cos x)\Big|_0^{\pi/2}$

$= -\left[\cos \pi/2 - \cos 0\right]$

$= -\left[0-1\right] = 1$

Q $\int_0^{\pi} \sin x \, dx = (-\cos x)\Big|_0^{\pi}$

$= -\left[\cos\pi - \cos 0\right]$

$= -\left[-1-1\right] = 2$

Q $\int_0^{\pi/2} \cos x \, dx = (\sin x)\Big|_0^{\pi/2} = \sin\frac{\pi}{2} - \sin 0$

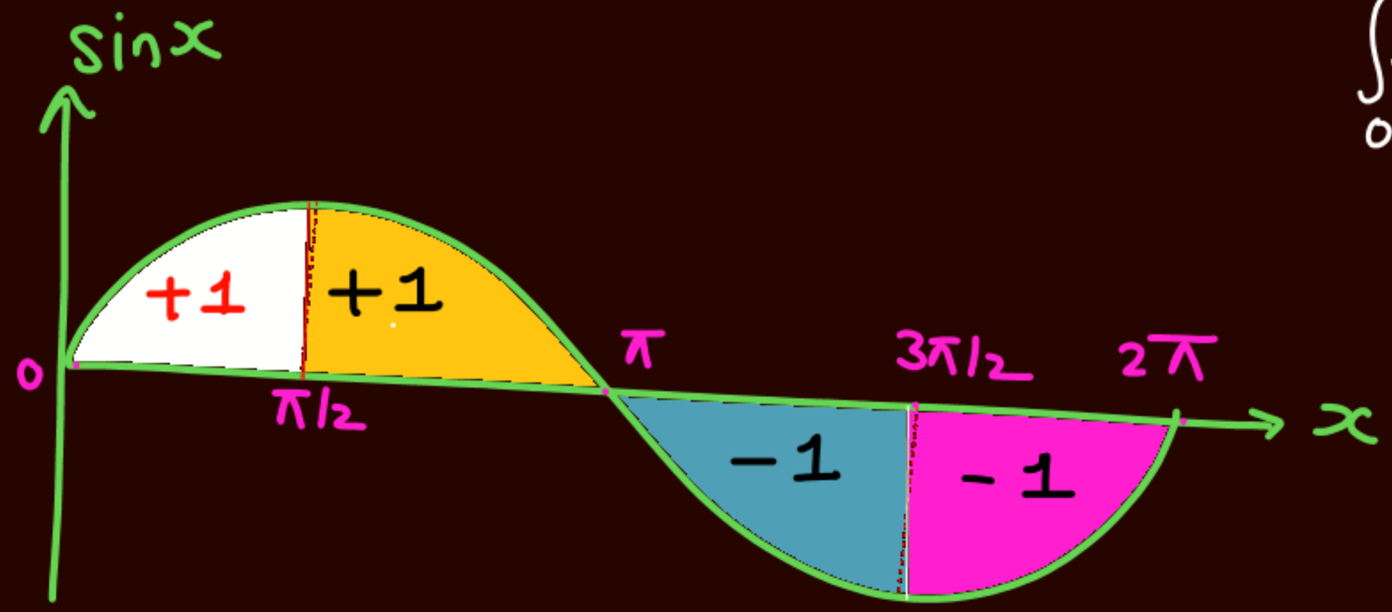
$= 1-0$

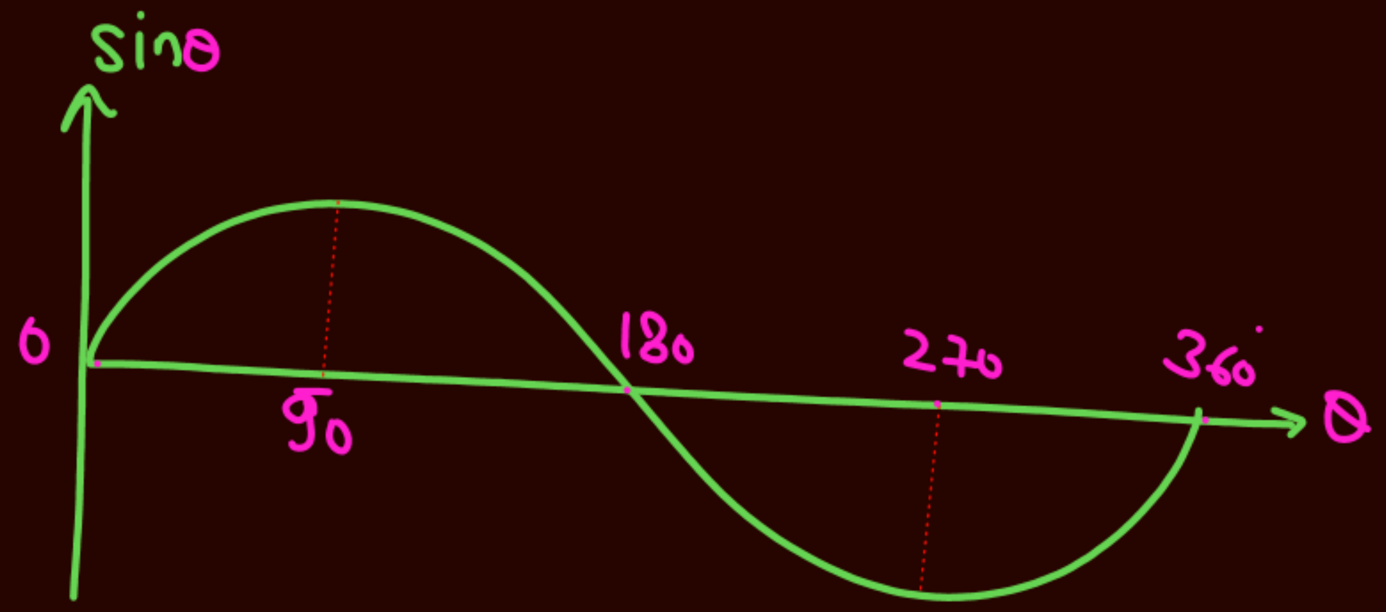
$= 1$

Q $\int_0^{\pi/2} \sin x \, dx = 1$ = Area Under Curve from $x=0$ to $x=\pi/2$

$\int_0^{90^\circ} \sin\theta \, d\theta = 1$

$\int_0^{\pi} \sin x \, dx = 2$





$\int_0^{\pi/2} \sin x \, dx = 1$

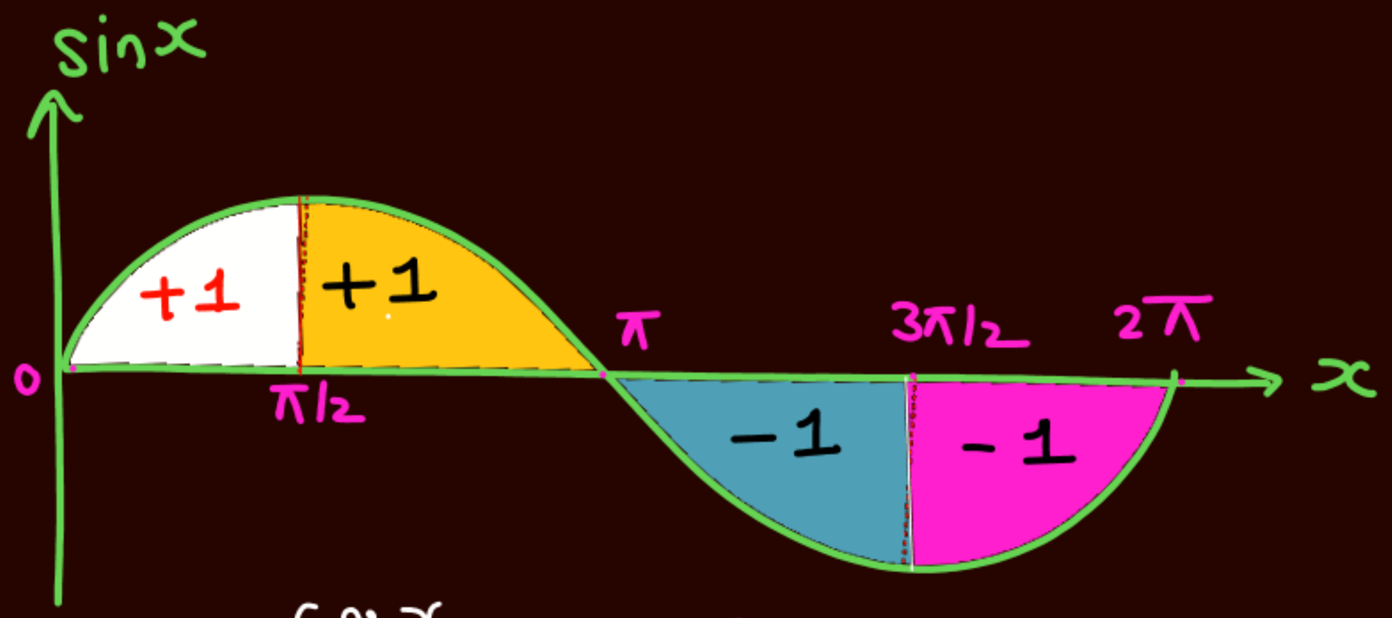
$\int_{\pi/2}^{\pi} \sin x dx = 1$

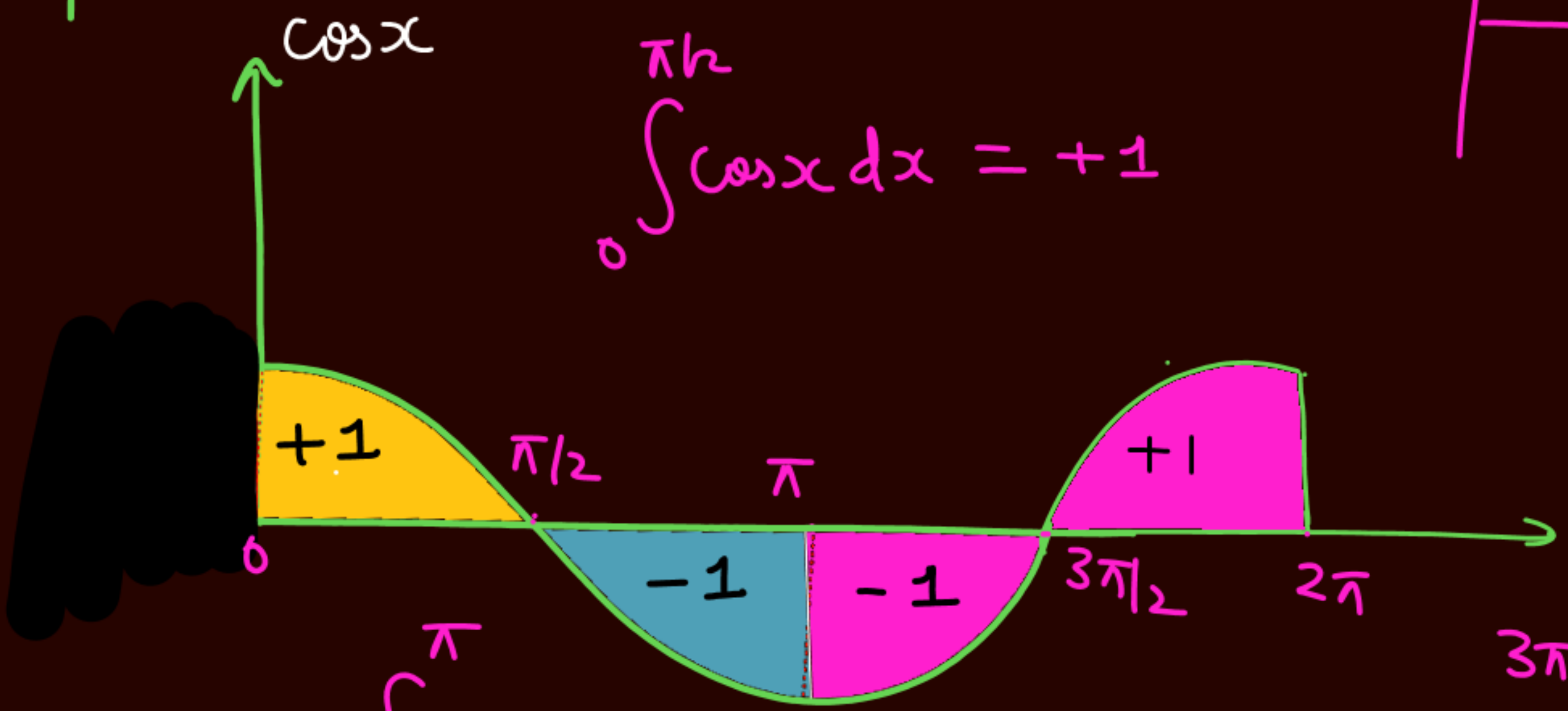
$\int_{\pi/2}^{3\pi/2} \sin x dx = 1 - 1$

$= 0$

$\int_{\pi}^{2\pi} \sin x dx = -1 - 1$

$= -2$

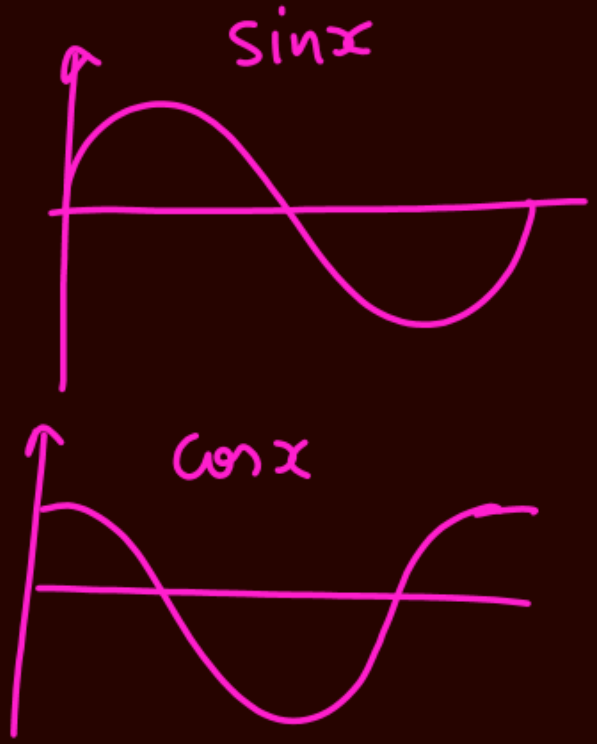




$$\int_0^{\pi/2} \cos x\, dx = +1$$

$$\int_0^{\pi} \cos x\, dx = 1-1 = 0$$

$$\int_0^{3\pi/2} \cos x\, dx = -1$$



$$\int_0^{\pi/2} \sin x\, dx = 1$$

$$\int_{\pi/2}^{\pi} \sin x\, dx = 1$$

$$\int_{\pi/2}^{3\pi/2} \sin x\, dx = 1-1$$
$$= 0$$

$$\int_{\pi}^{2\pi} \sin x\, dx = -1-1$$
$$= -2$$

$$\int y\,dx \equiv$$

Q $\int_0^{\pi} \cos x \, dx$

$= (\sin x)\Big|_0^{\pi}$

$= \sin\pi - \sin 0$

$= 0 - 0 = 0$

Q $\int_0^{180^\circ} \cos\theta \, d\theta = \sin\theta\Big|_0^{180^\circ}$

$= \sin 180^\circ - \sin 0^\circ$

$= 0 - 0 = 0$

Q $\int_{90^\circ}^{180^\circ} \cos\theta \, d\theta = \sin 180 - \sin 90^\circ$

$= 0 - 1$

$= -1$

Q $\displaystyle\int_0^{\pi/3} \cos x \, dx$

$= \sin x \Big|_0^{\pi/3}$

$= \sin \pi/3 - \sin 0$

$= \frac{\sqrt{3}}{2}$

Q $\displaystyle\int_{-\pi/3}^{\pi/2} \cos x \, dx$

$= \sin(\pi/2) - \sin(-\pi/3)$

$= 1 + \sin \pi/3$

$= 1 + \frac{\sqrt{3}}{2}$

Q $\displaystyle\int_0^{\pi/4} \cos x \, dx$

$= \sin \frac{\pi}{4} - \sin 0$

$= \frac{1}{\sqrt{2}}$

Q $\displaystyle\int_0^{90^\circ} \sin\theta \, d\theta = (-\cos\theta)\Big|_0^{90^\circ} = -(\cos 90^\circ - \cos 0)$

$= +1$

Q $\displaystyle\int_0^{180^\circ} \sin\theta \, d\theta = (-\cos\theta)\Big|_0^{180^\circ} = -(\cos 180 - \cos 0) = -(-1-1)$

$= 2$

Partial Differential $\longrightarrow$ WPE वाले Jarurat

padegi

Q $\quad y = \sin 2x$

$$\frac{dy}{dx} = 2 \cdot \cos 2x$$

\# $\int \cos 2x \, dx = \frac{\sin 2x}{2}$

Q $\quad \int \cos x \, dx = \sin x +$

Q $\quad \int 2\cos 2x \, dx = \sin 2x + C$

$$2\int \cos 2x \, dx = \sin 2x + C$$

$$\int \cos 2x \, dx = \frac{1}{2}\sin 2x + C'$$

Q $\int \cos 2x\,dx = \frac{\sin 2x}{2} + c$

Q $\int \cos 5x\,dx = \frac{1}{5}\sin 5x + c$

Q $\int \cos(3x+4)\,dx = \frac{\sin(3x+4)}{3} + c$

Q $\int \sin(3x)\,dx = \frac{-\cos 3x}{3} + c$

Q $\int \sin(2x+3)\,dx$

$= \frac{-\cos(2x+3)}{2} + c$

$\int \cos(ax+b)\,dx = \dfrac{\sin(ax+b)}{a}$

$\int \sin(ax+b)\,dx = \dfrac{-\cos(ax+b)}{a}$

$\int \dfrac{1}{ax+b}\,dx = \dfrac{1}{a}\ln(ax+b)$

$\int e^{ax+b}\,dx = \dfrac{e^{ax+b}}{a}$

Q $\int \cos 5x\,dx = \dfrac{\sin(5x)}{5} + c$

Q $\dfrac{d}{dx}\sin(2x+3) = 2.\cos(2x+3)$

$\int \sin(2x+3)\,dx = \dfrac{-\cos(2x+3)}{2}$

$+ c$

Q $\int \cos 2x \, dx = \frac{\sin 2x}{2} + c$

$\boxed{\int dx = x}$

$\int dx = \int x^0 dx = \frac{x^{0+1}}{0+1}$

$= x$

Q $\int \cos(\omega t + \phi) dt = \frac{\sin(\omega t + \phi)}{\omega} + c$

Q $\int \cos^2 x \, dx = \int \frac{1 + \cos 2x}{2} dx = \int \left(\frac{1}{2} + \frac{1}{2} \cos 2x\right) dx$

$\cos 2x = 2\cos^2 x - 1$

$= \int \frac{1}{2} dx + \frac{1}{2} \int \cos 2x \, dx$

$= \frac{1}{2} \cdot x + \frac{\sin 2x}{2 \times 2} + c$

Q $\int \sin^2 x \, dx = \int \left(\frac{1}{2} - \frac{1}{2}\cos 2x\right) dx = \frac{1}{2}x - \frac{1}{2}\,\frac{\sin 2x}{2} + c$

$\cos 2x = 1 - 2\sin^2 x$

$\sin^2 x = \frac{1 - \cos 2x}{2}$

$\sin x \xrightarrow{\text{Diff.}} \cos x$

$\text{Cox} \xrightarrow{\text{Diff.}} -\sin x$

$\cos x \xrightarrow{\text{Integration}} \sin x$

$\sin x \xrightarrow{\text{Integration}} -\cos x$

Q $F = 3x^2 + 4x^3$

(WD) by force from $X=0$ to $X=2$

$$WD = \int F\,dx = \int_0^2 (3x^2+4x^3)\,dx = (x^3+x^4)\Big|_0^2 = 8+16 = 24$$

Q $(WD)_{gas} = \int P\,dV$ (thermodynam)

$P = V^2$ (process) find $(WD)_{\text{by gas}}$ if gas expand from $V_i = 1m^3$ to $V_f = 2m^3$

$$W_{gas} = \int_1^2 V^2\,dV = \checkmark$$

Q $\displaystyle\int \frac{\sqrt{x}}{x^2}\,dx$

Q $\displaystyle\int \left(\frac{1}{x^2} + 3\sin 2x\right) dx$

Q $\displaystyle\int_1^5 x^2\,dx$

Q $\int_{-1}^{1}(ax^2+b)\,dx$

Q $\int_{R}^{\infty}\frac{GMm}{r^2}\,dr$

Q $\int_{r_1}^{r_2}\frac{-kq_1q_2}{r^2}\,dr$

Q

$$\int_{u}^{v} mv\,dv$$

Q $\int_0^{\pi} \sin x \, dx$

Q $\int_0^{\pi} \cos x \, dx$.

Q $\displaystyle\int_{-\pi/2}^{\pi/2} \cos x \, dx$

Vector .

Vector

(A) आता है 35%

(B) नहीं आता है 20%

45% (3) कुछ-2 आता।

Vector

Scaler → those phy. quan. which have magnitude but no dir^n.

Ex. Speed, distance

Vector → those physical quan. which have

① magnitude

② Direction

③ Follow Law of Vector algebra.

Ex. Force, momentum . .

Homework

- KPP (both 5 and 6)

THANK YOU