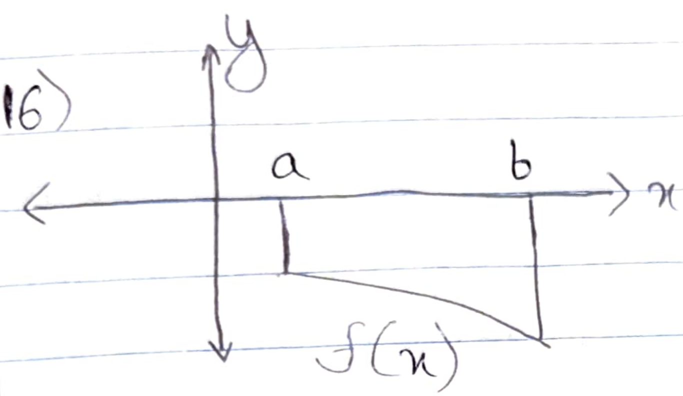
16)



Given $f(x)$ value for $x = a$ $x = b$

are negative, $x \in [a, b]$

$\int_a^b f(x)dx =$ Area bounded by $f(x)$ and x-axis

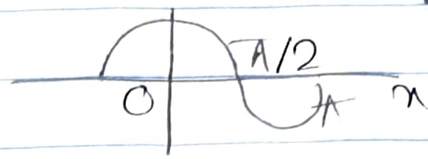
If the graph is $\begin{cases} \text{above } x\text{-axis} - \text{positive} \\ \text{below } x\text{-axis} - \text{negative} \end{cases}$

As $f(x)$ below x-axis, Area is negative

for $x \in [a, b]$

$\int_a^b f(x)dx$ is negative < 0

1B) $\int_0^{\pi} \cos x \, dx$



$(0 \to \pi/2) \to$ positive

$(\pi/2 \to \pi) \to$ negative

$\therefore$ Net signed area $= \int_0^{\pi} \cos x \, dx$

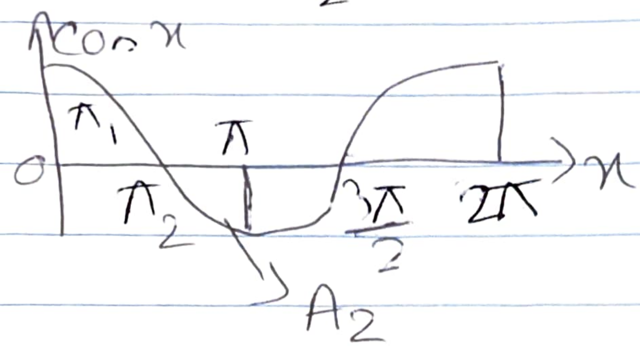
$= [\sin x]_0^{\pi}$

$= \sin \pi - \sin 0$

$= 0$

17) Given, $\int_0^{\pi/2} \cos x \, dx = I \Rightarrow \int_{\pi/2}^{\pi} \cos(x) \, dx$

We know,



$0 \le x \le \frac{\pi}{2} \Rightarrow \cos x > 0 \Rightarrow$ Area I

$\frac{\pi}{2} < x < \pi \Rightarrow \cos x < 0 \Rightarrow$ Area $= A_2$

We know, both areas are ~~equal~~ equal

$\int_{\pi/2}^{\pi} \cos(x) \, dx = -A_2 = -I$