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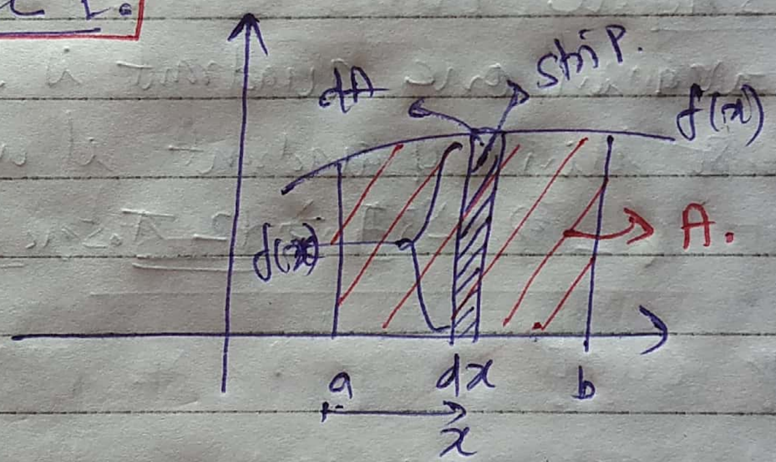
Lecture - 3

Definite integration

concepts and formula's to remember.

→ since it is starting for finding the bounded area under curve so one should remember the fundamental method and techniques given below. we start will Area under curve and between x-axis or y-axis, so they can have many case like

case 1:



$f(x) > 0$

case.

so intutively think always in terms of strip only so

$$dA = f(x)dx$$

and if we look $dA = f(x)dx$ then we have proved also that

A will be equal to $\int_a^b f(x)\,dx$.

$\int_a^b f(x)dx$ is +ve as $f(x)$ is +ve.

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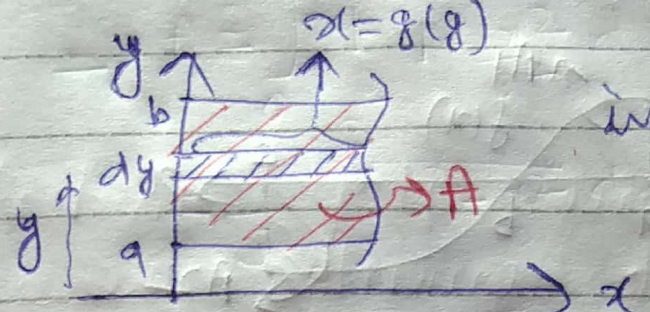
So our area is $A = \int_a^b f(x)dx$

case 2:



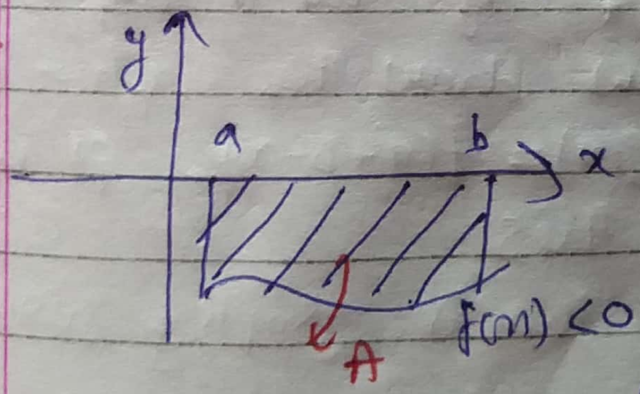
in this type of case it is easy to solve if we take horizontal strip.

So elementary area $dA = g(y)dy$

So Note:- in this method your function must be function of x in term of y. example $x = 2y^2 + y + \ln y$ like this.

So $A = \int_{y=a}^{y=b} g(y)dy.$

case 3:



here it is similar to case 1.

but since $f(x) < 0$ we will get

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

So reagore area $= |A|$

where $|A| = \left|\int_a^b f(x)dx\right|.$

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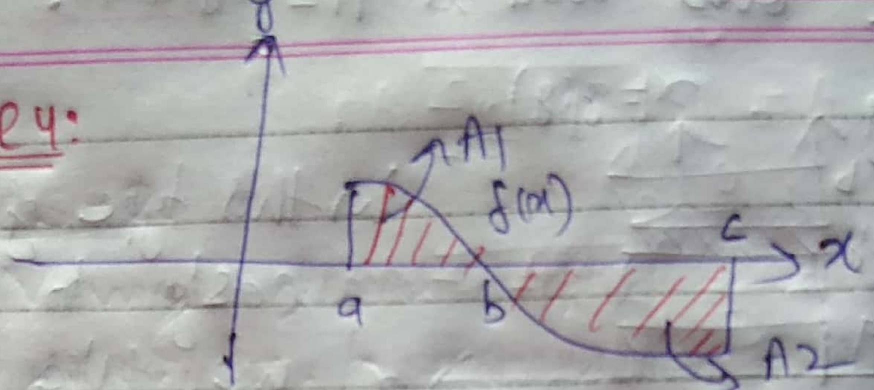
case 4:



clealy area till a to b is like case

and till b to c like case 3.

so $A = A_1 + |A_2|$

where $A = \int_a^b f(x)\,dx + \left|\int_b^c f(x)\,dx\right|$