

ASSIGNMENT.

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Subject: Numerical Analysis.

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## i). Integration Concept:

In differentiation, we studied that if a function  $f$  is differentiable in an interval say,  $I$ , then we can get a set of a family of values of the functions in that interval, Is there any way by which we can get to know about the function if the values of the function within an interval are known?

→ This process is the reverse of finding a derivative. Integrations are the anti-derivatives. Integrations are the way of adding the parts to find the whole. Integration is the whole pizza and the slices are differentiable functions

which can be integrated. If  $f(x)$  is any function and  $f'(x)$  and  $f''(x)$  is its derivatives. The integration of  $f'(x)$  with respect to  $dx$  is given as.

$$\int f'(x) dx = f(x) + c$$

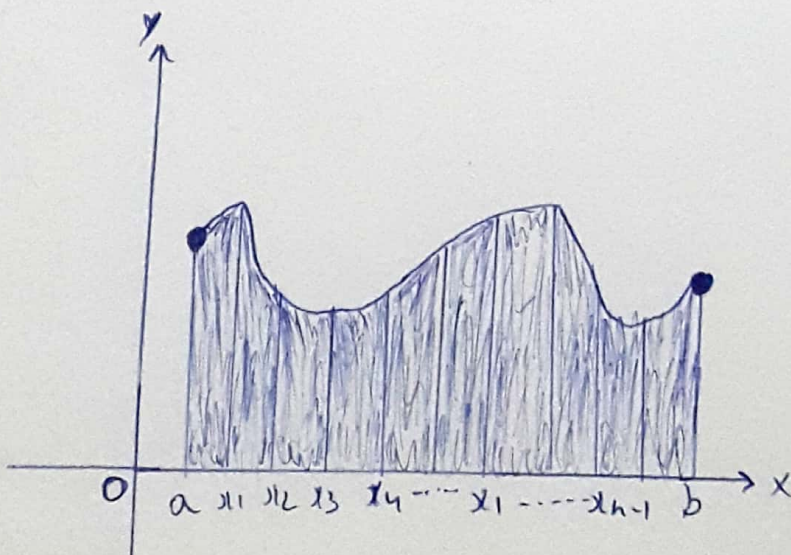
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## ii):- Application of Trapezoidal Rule: in Engineering:-

In Calculus, "Trapezoidal Rule" is one of the important integration rules. The name trapezoidal is because when the area under the curve is evaluated, then the total area is divided into small trapezoids. instead of rectangles.

This rule is used for approximating the definite integrals where it uses the linear approximations of the functions.



### iii). Application of Simpson's Rule in Engineering.

Application of Simpson's Rule in Engineering is when solving buoyancy and stability problems when designing a new marine vessel.

Examples of the use of Simpson's Rule in this discipline include the calculation of a vessel's displacement, total wetted surface area, and the calculation of the longitudinal center of buoyancy of the hull.