Lecture 9

Tuesday, January 24, 2023 8:10 AM

* Questions.

$S(x) = \int_a^x f(t)\,dt$ is an antiderivative of f satisfying $S(a) = 0$.

Ex Find $\int_1^2 t\,dt$.

$S(x) = \int_1^x t\,dt$ is an antiderivative of t, which is $\frac{t^2}{2} + C$, such that

$S(1) = 0$

$S(x) = \frac{x^2}{2} + C$

$S(1) = \frac{1}{2} + C = 0 \rightsquigarrow C = -\frac{1}{2}$

So,

$$S(x) = \frac{x^2}{2} - \frac{1}{2}$$

Therefore,

$$\int_1^2 t\,dt = S(2) = \frac{2^2}{2} - \frac{1}{2} = \frac{3}{2}$$