

Episode 1: What an integral is

Integral

indefinite

$$\int f(x) dx$$

a class of f-ns

$$F(x) + C$$

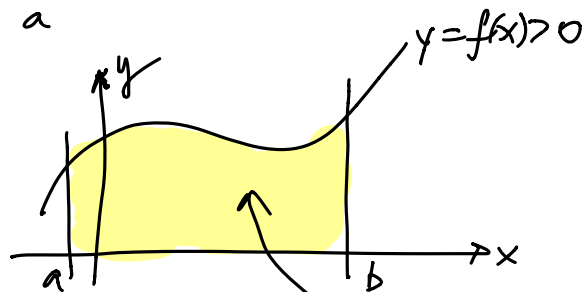
antider. of f : $F'(x) = f(x)$

$$\int f(x) dx \xrightarrow{\frac{d}{dx}} f(x) \xrightarrow{\frac{d}{dx}} f'(x)$$

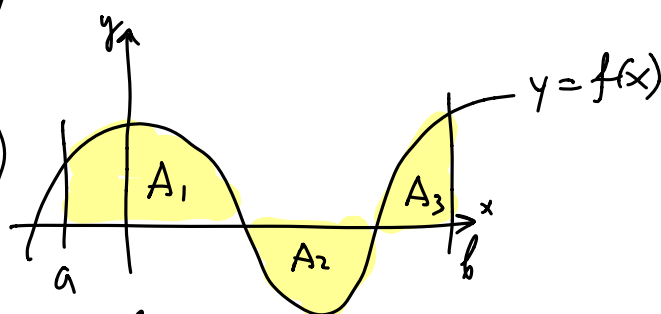
antider. f-n deriv.

definite

$$\int_a^b f(x) dx \quad \text{a number}$$



$$\int_a^b f(x) dx = \text{Area}$$



$$\int_a^b f(x) dx = A_1 - A_2 + A_3$$

Indef. & Def. integrals are related by FTC:

$$\underbrace{\int_a^b f(x) dx}_{\text{Def. } \int} = \underbrace{F(x)}_{\text{indef.}} \bigg|_a^b = F(b) - F(a)$$

How to integrate (= find an antider.)

