

Es: What are the properties of definite Integrals?

Two special properties

$$(1) \int_a^a f(x) dx = 0$$

$$(2) \int_b^a f(x) dx = -\int_a^b f(x) dx$$

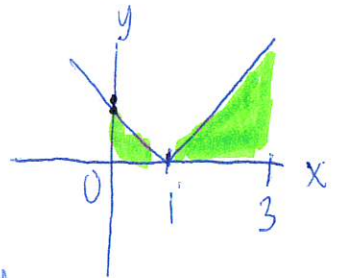
Additive Property

c is between [a, b]

$$(3) \int_a^b f(x) dx = \int_a^c f(x) dx + \int_c^b f(x) dx$$

(ex)  $\int_0^3 |x-1| dx$

$$= \int_0^1 -(x-1) dx + \int_1^3 (x-1) dx$$



We use for absolute value f(x)

Constant

$$(4) \int_a^b K f(x) dx = K \int_a^b f(x) dx$$

Sum/difference

$$(5) \int_a^b [f(x) \pm g(x)] dx = \int_a^b f(x) dx \pm \int_a^b g(x) dx$$

Rewriting

(ex)  $\int_1^3 \frac{\sqrt{x} + x}{3} dx = \frac{\text{Rewrite}}{3} \int_1^3 (\sqrt{x} + x) dx = \dots \text{Integrate}$

Summary