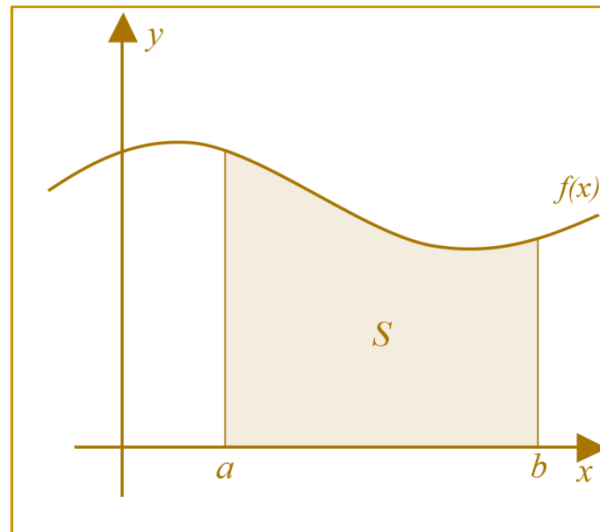


Integral



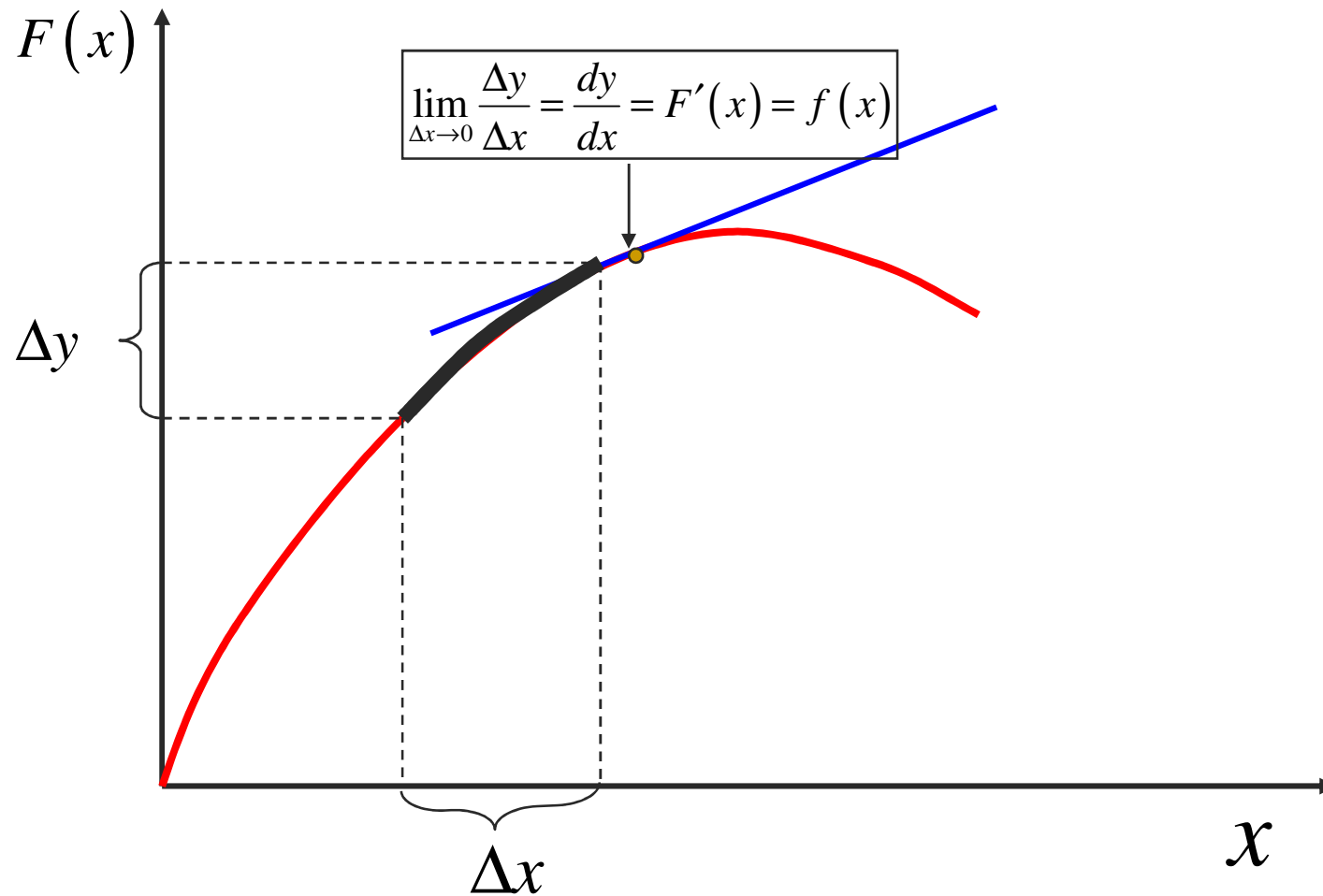
A decorative graphic consisting of a thin yellow circle. A thick black bracket is on the left side, and a thick yellow bracket is on the right side. A horizontal bar with a white center and olive green ends is overlaid on the circle.

Integral = Antiderivatives

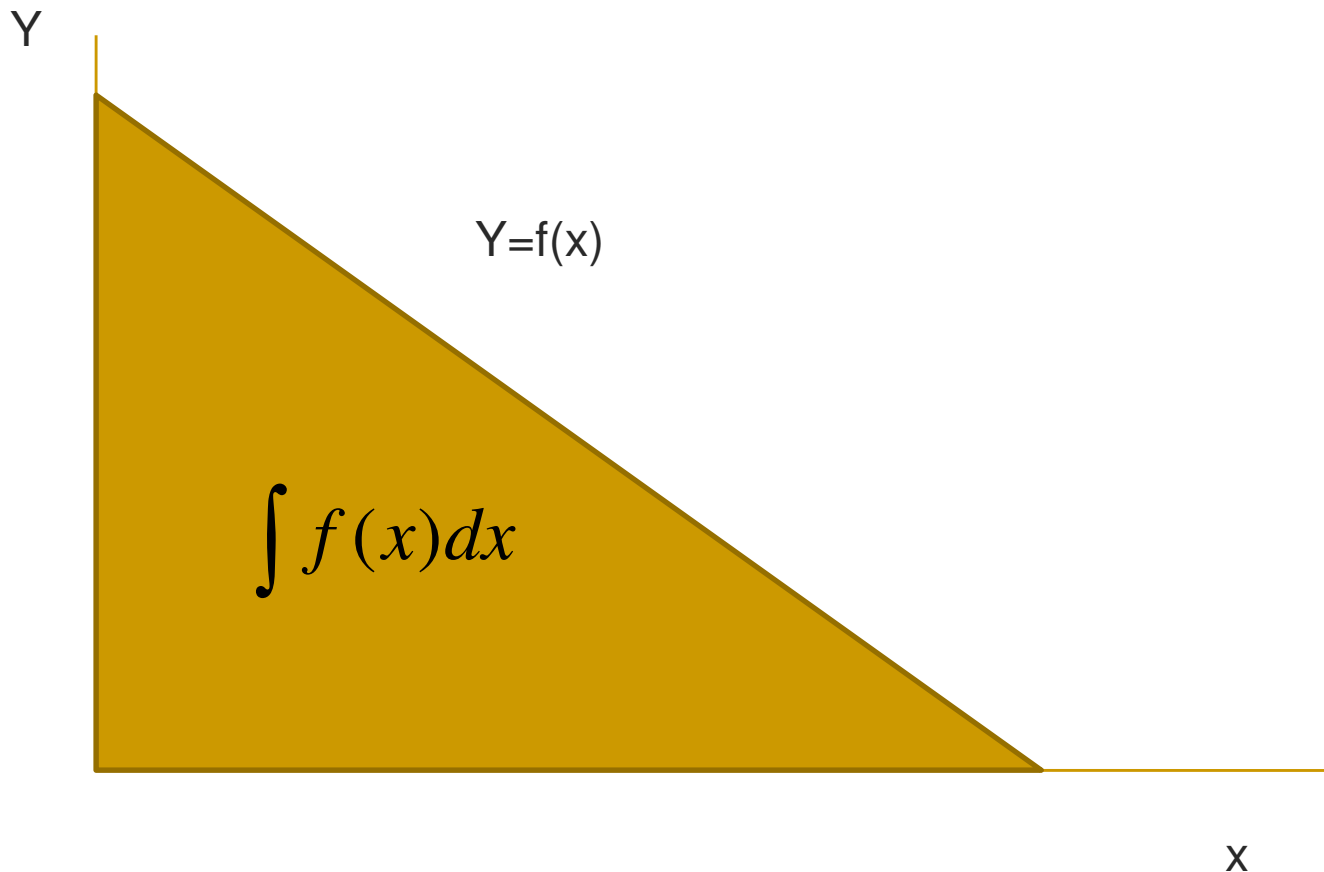
Derivative; $F(x) \rightarrow f(x)$

Integral; $f(x) \rightarrow F(x)$

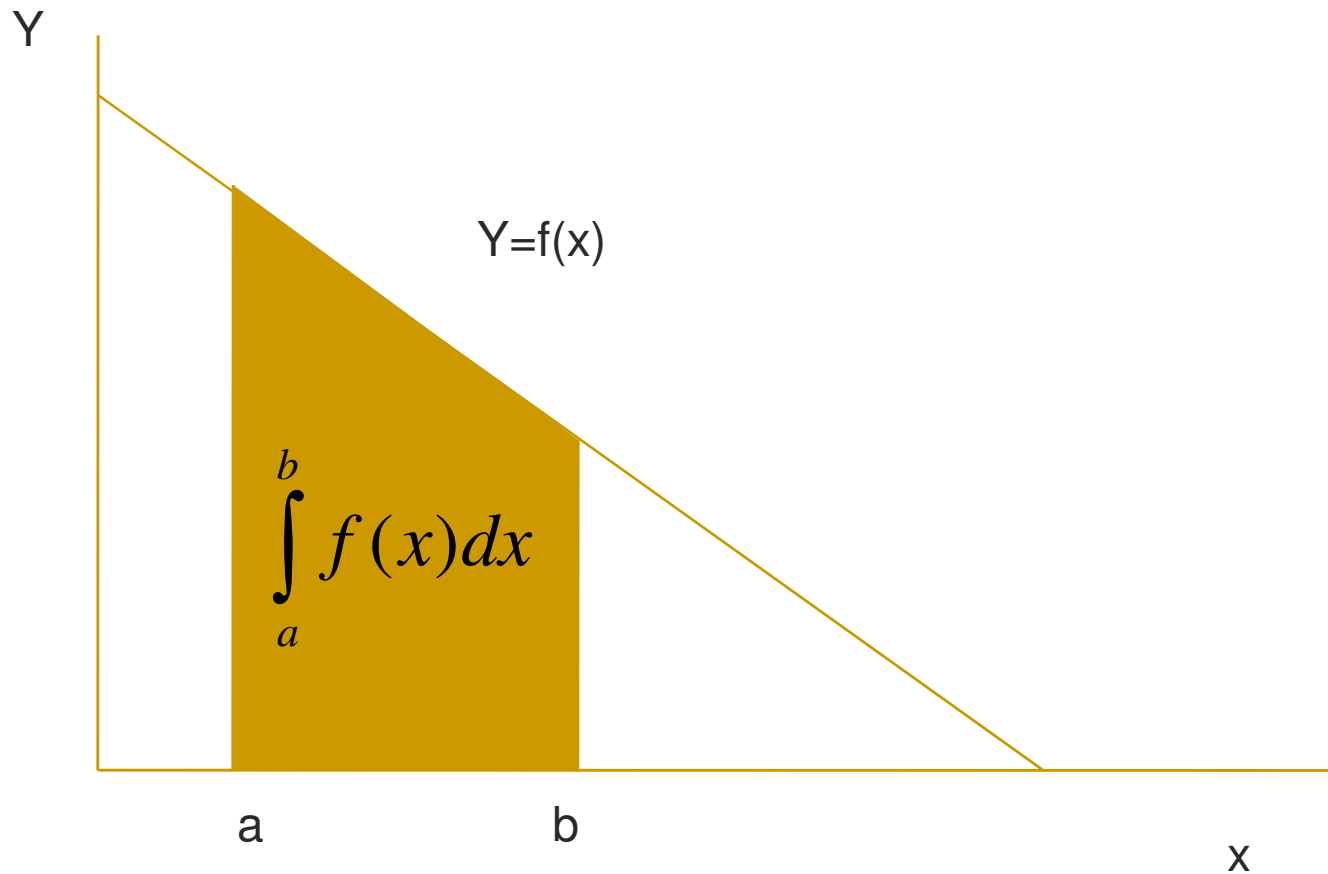
Konsep limit dan slope



Konsep limit dan area di bawah kurva



[Definite (proper) integral]



Integral vs derivative

$$y = F(x)$$

$$y' = F'(x) = \frac{dy}{dx} = f(x)$$

$$dy = f(x) dx$$

$$\int dy = \int f(x) dx = F(x) + c$$

Aturan pangkat (Power rule)

$$y = F(x) = \frac{1}{3}x^3$$

$$y' = f(x) = x^2$$

$$\int x^2 = \frac{1}{3}x^3$$

$$y' = f(x) = x^n$$

$$\int x^n = \frac{1}{(n+1)}x^{n+1}$$

[Aturan Penambahan/Pengurangan]

$$\int [f(x) \pm g(x)] dx = \int f(x) dx \pm \int g(x) dx$$

$$= F(x) + c_1 \pm G(x) + c_2 = F(x) \pm G(x) + (c_1 + c_2)$$

$$= F(x) + G(x) + c$$

Definite integral

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

- a = lower limit
- b = upper limit

$$\int_1^5 3x^2 dx = x^3 \Big|_1^5 = (5)^3 - (1)^3 = 125 - 1 = 124$$

Improper integral

$$\int_a^{\infty} f(x) dx$$

$$\lim_{b \rightarrow \infty} \int_a^b f(x) dx$$

$$\int_{-\infty}^b f(x) dx$$

$$\lim_{a \rightarrow -\infty} \int_a^b f(x) dx$$