Pertemuan 26.

Integral tertentu :

Misalkan f(x) kontinu pada interval $a \leq x \leq b$.

- Bentuk umum

$$\int_a^b f(x)\,dx = F(x)\Big|_a^b = F(b) - F(a)$$

f(x) disebut integrand, a = batas bawah dan b = batas Atas.

Sifat-sifat integral tertentu:

Bila f(x) dan g(x) kontinu pada $a \le x \le b$

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

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

3. $\int_a^b \{f(x) \pm g(x)\}dx = \int_a^b f(x)dx \pm \int_a^b g(x)dx$

4. $\int_a^b k\, f(x)\, dx = k \int_a^b f(x) dx$

5. $\int_a^b f(x)dx + \int_b^c f(x)dx = \int_a^c f(x)\, dx$

Contoh :

1. $\int_{-2}^{3} 2x\,dx = 3/2\,x^2 \Big|_{-2}^{3} = 3/2(3)^2 - 3/2\,(-2)$

$= 3/2(9) - 3/2\,(4) = 27/2 - 12/2$

$= 15/2$

2. $\int_{0}^{\pi/4} \cos 2x\,dx = \tfrac{1}{2}\sin 2x \Big|_{0}^{\pi/4} = \tfrac{1}{2}\sin \pi/2 - \tfrac{1}{2}\sin 0$

$= \tfrac{1}{2} - 0 = 1/2$

Soal latihan :

1. $\int_{1}^{4} (2+x)\, dx$

2. $\int_{0}^{3} \frac{dx}{\sqrt{1+x}}$

3. $\int_{1}^{8} \sqrt{1+3x}\, dx$