

Contoh 1

Hitunglah $\int_0^4 x\sqrt{x^2 + 9} dx$

Penyelesaian

Misalkan $u = x^2 + 9$, dan $du = 2x dx$


$$\int x \sqrt{x^2 + 9} dx = \frac{1}{2} \int \sqrt{x^2 + 9} (2x dx)$$

$$= \frac{1}{2} \int u^{1/2} du$$

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$$\int x \sqrt{x^2 + 9} dx = \frac{1}{2} \int \sqrt{x^2 + 9} (2x dx)$$

$$= \frac{1}{2} \int u^{1/2} du = \frac{1}{2} \cdot \frac{2}{3} u^{3/2} + C = \frac{1}{3} u^{3/2} + C$$


$$\int_0^4 x \sqrt{x^2 + 9} dx = \left[\frac{1}{3} (x^2 + 9)^{3/2} \right]_0^4$$

$$= \frac{125}{3} - \frac{27}{3} = \frac{98}{3}$$

Cara lainnya, yaitu merubah $du = 2x dx$

$$\frac{1}{2} du = x dx$$

Dilanjutkan seperti di halaman sebelumnya

Contoh 2

Carilah $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$

Penyelesaian

Andaikan $u = \sqrt{x} = x^{1/2}$, sehingga $du = \frac{1}{2}x^{-1/2} dx$

$$\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx = 2 \int \sin \sqrt{x} \left(\frac{1}{2}x^{-1/2} dx\right)$$

$$= 2 \int \sin u du = -2 \cos u + C$$

$$= -2 \cos \sqrt{x} + C$$

Gunakan metode substitusi untuk mencari integral tak tentu dan integral tentu berikut.

1. $\int \sqrt{3x + 2} dx$

2. $\int_0^{\pi/6} \sin^3 \theta \cos \theta d\theta$

**TUGAS
LATIHAN
SOAL**