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No.

Prak. Fiskom - Penyelesaian Integral Eksak

Date

$$I = \int_1^{10} x^2 \exp(-x) dx$$

$$I = \int_1^{10} x^2 e^{-x} dx$$

$$= \int x^2 e^{-x} dx$$

$$= x^2 (-e^{-x}) - \int -e^{-x} 2x dx$$

$$= x^2 (-e^{-x}) - 1(-2) \int e^{-x} x dx$$

$$= x^2 (-e^{-x}) + 2x \int x e^{-x} dx$$

$$= x^2 (-e^{-x}) + 2(x(-e^{-x})) - \int -e^{-x} dx$$

Gunakan sifat Integral  $\int -f(x) dx = -\int f(x) dx$

$$= x^2 (-e^{-x}) + 2(x(-e^{-x})) + \int e^{-x} dx$$

Gunakan  $\int e^{-x} dx = -e^{-x}$

$$= x^2 (-e^{-x}) + 2(x(-e^{-x})) - e^{-x}$$

Sederhanakan

$$= -x^2 e^{-x} - 2x e^{-x} - 2e^{-x}$$

Kembali ke limit dan integral  $\int_1^{10}$

$$= (-x^2 e^{-x} - 2x e^{-x} - 2e^{-x}) \Big|_1^{10}$$

Menggunakan  $f(x) \Big|_a^b = f(b) - f(a)$

$$= -10^2 e^{-10} - 2 \cdot 10 e^{-10} - 2e^{-10} - (-1^2 e^{-1} - 2 \cdot 1 e^{-1} - 2e^{-1})$$

$$= -\frac{122}{e^{10}} + \frac{5}{e}$$

$$I \approx 1,83386$$