1st Week Thursday

23 Subat 2023 Persembe 11:22

Integration By



$$\frac{1}{1} \frac{1}{1} \frac{1}{1} = \frac{7}{1}$$

$$\frac{u = ---}{dv} \xrightarrow{\text{oregrate}} du = -\sqrt{}$$

$$\frac{dv}{dv} = --- dx \xrightarrow{\text{oregrate}} v = \sqrt{}$$

$$= \underbrace{u.v} - \underbrace{\int v.du}$$

$$\frac{dv}{dx} = \overline{w} - \int \overline{v} dx$$

$$\int_{1}^{\infty} \frac{\ln(x) dx}{\ln dx} = \frac{\ln(x)}{\sqrt{x}} = \frac{\ln(x) \cdot x - \sqrt{x}}{\sqrt{x}} = \frac{\ln(x) \cdot x - x + C}{\sqrt{x}}$$

$$u = \ln(x) \qquad dv = \int_{1}^{\infty} \frac{dx}{\sqrt{x}} = \frac{\ln(x) \cdot x - x + C}{\sqrt{x}}$$

$$qn = \frac{x}{1} \frac{qx}{qx}$$

$$M = fu(x)$$

$$2x = \sqrt{\frac{x}{4x}}$$

$$A = 6v(x)$$

$$A = \sqrt{\frac{x}{4x}}$$

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$$\int_{\int u dv}^{\sqrt{v}} \int_{\sqrt{v}}^{\sqrt{v}} \int_{\sqrt{v}}^{\sqrt{v}} dx = u.v - \int_{\sqrt{v}} \frac{v.du}{v} = x. \frac{\sin(5x)}{5} - \frac{\sin(5x)}{5} + dx$$

$$\frac{du = 1}{dx} \cdot \frac{dx}{dx} = \int \frac{dx}{dx} =$$

$$= \times \cdot \frac{\sin(5x)}{5} - \frac{\sin(5x)}{5} + dx$$

$$= \times \cdot \frac{\sin(5x)}{5} + \frac{dx}{5}$$

$$\int_{V=\frac{\sin(5x)}{5}}^{dv=\cos(5x)} dx$$

$$= x. \frac{\sin(5x)}{5} - \frac{1}{5} \frac{-\cos(5x)}{5} + C$$

$$\int_{\text{poly}}^{\text{Judu}} e^{x} dx = \underbrace{uv - \int_{\text{Vdu}}}_{\text{poly}} = \underbrace{x^{2} \cdot e^{x}}_{\text{poly}} - \underbrace{\int_{\text{ex}}^{\text{Z}} e^{x} dx}_{\text{poly}}$$

$$u = x^{2} \int dv = \int e^{x} dx$$

$$du = 2x dx \qquad v = e^{x}$$

it need int. by parts

once more!

$$\frac{e^{x} \cdot x \, dx}{u = x \cdot e^{x} - \int e^{x} \cdot 1 \, dx}$$

$$u = x \quad dv = e^{x} \, dx \quad e^{x}$$

$$\frac{du}{du} = 1 \cdot dx \quad v = e^{x}$$

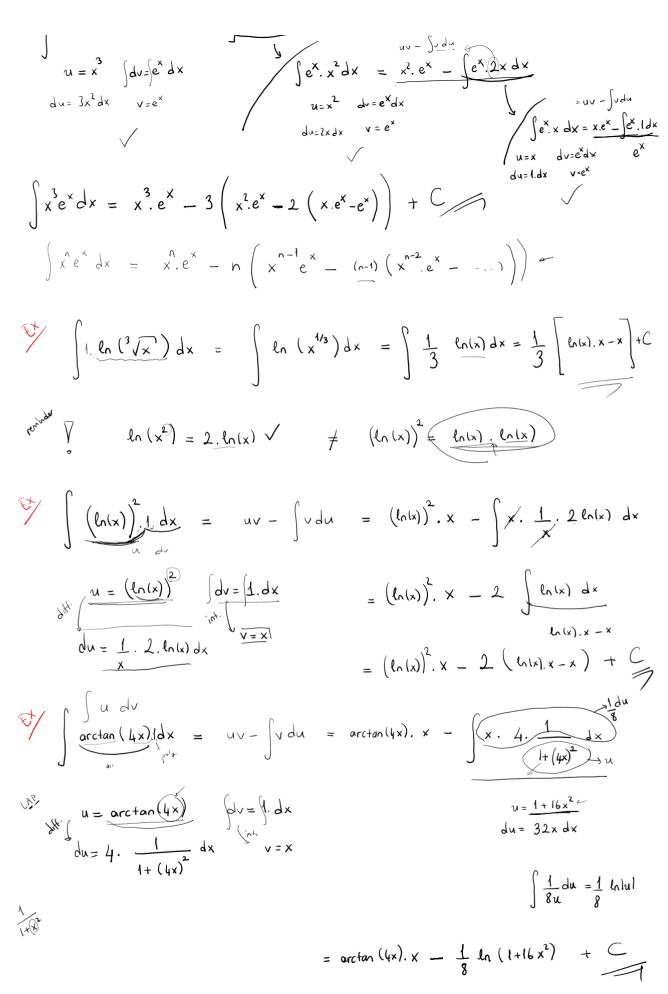
$$= x^{2}.e^{x} - 2\left(\underbrace{x.e^{x} - e^{x}}\right) + C$$

$$\int_{0}^{3} x^{2} dx = x^{3} \cdot e^{x} - \int_{0}^{2} e^{x} dx$$

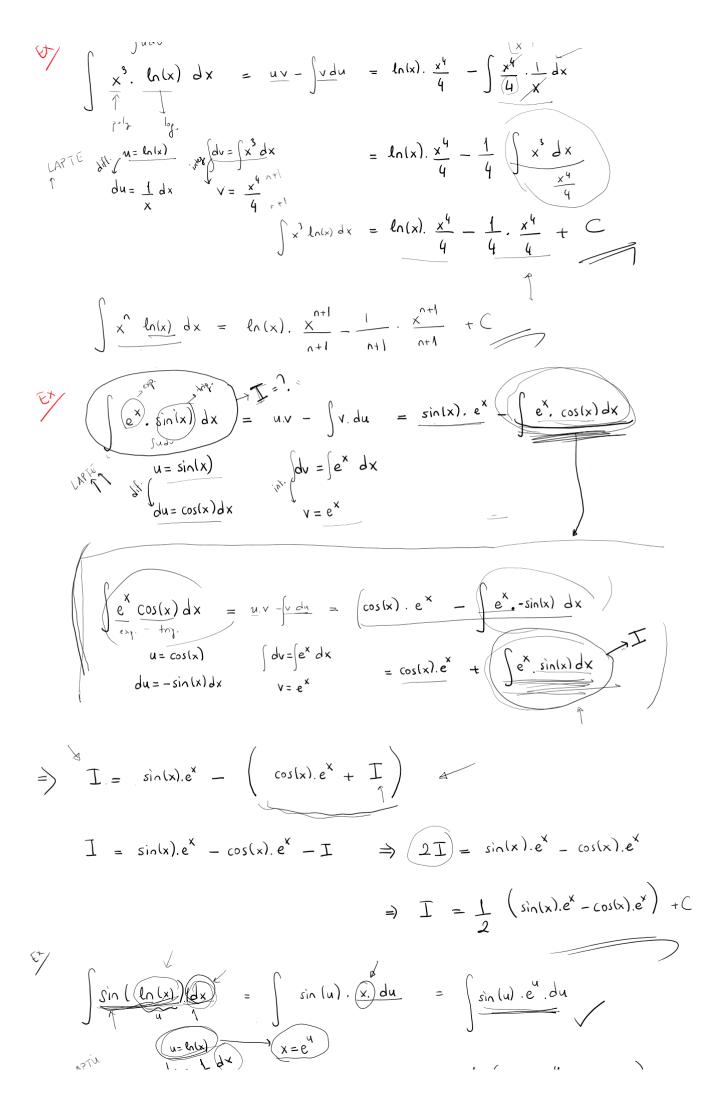
$$u = x^{3} \quad dv = e^{x} dx$$

$$u = x^{3} \quad dv = e^{x} dx$$

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



 $\int_{x^{3}} u dv = uv - \int_{y} u du = ln(x) \cdot \frac{x^{4}}{4} - \int_{x} \frac{x^{4}}{4} \cdot \frac{1}{x} dx$



$$\frac{du = L}{dx}$$

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$$= \frac{1}{2} \left(\sin(u) \cdot e^{u} - \cos(u) \cdot e^{u} \right)$$

$$= \frac{1}{2} \left[sin(\ln x)). \times - cos(\ln x). \times \right] + C$$

$$\int \cos\left(\frac{1}{x}\right) dx = \int \cos(u) 2(x) du = \int \cos(u) \cdot 2u du$$

$$= 2 \cdot u \sin(u) + \cos(u)$$

$$du = \frac{1}{2x} dx \rightarrow dx = 2(x \cdot du)$$

$$= 2 \cdot (x \cdot \sin(x) + \cos(x) + cos(x) +$$

LARTE_

$$\int \frac{\cos(x) \cdot x}{\cos(x) \cdot x} dx = uv - \int v du = x \cdot \sin(x) - \int \frac{\sin(x) \cdot 1}{\cos(x)} dx = x \cdot \sin(x) + \cos(x) + C$$

$$\int \frac{\cos(x) \cdot x}{\cos(x)} dx = x \cdot \sin(x) - \int \frac{\sin(x) \cdot 1}{\cos(x)} dx = x \cdot \sin(x) + \cos(x) + C$$

$$\int \frac{\cos(x) \cdot x}{\cos(x)} dx = x \cdot \sin(x) - \int \frac{\sin(x) \cdot 1}{\cos(x)} dx = x \cdot \sin(x) + \cos(x) + C$$

69. Suppose that $\underline{f(1)} = 2$, $\underline{f(4)} = 7$, $\underline{f'(1)} = 5$, $\underline{f'(4)} = 3$, and f'' is continuous. Find the value of $\int_{1}^{4} x f''(x) dx$.

$$\int_{0}^{4} \frac{x}{x} \int_{0}^{4} \frac{f''(x) dx}{dx} = uv - \int v du = x. f'(x) - \int f'(x) \cdot 1. dx$$

$$\int_{0}^{4} \frac{x}{x} \int_{0}^{4} \frac{f''(x) dx}{dx} = x. f'(x) - \int f'(x) \cdot 1. dx$$

$$\int_{0}^{4} \frac{x}{x} \int_{0}^{4} \frac{f''(x) dx}{dx} = x. f'(x) - \int f'(x) \cdot 1. dx$$

$$= x. f'(x) - f(x)$$

$$= (x. f'(x) - f(x)) \Big]_{1}^{4}$$

$$= 4. f'(4) - f(4) - 4. f'(1) - f(1)$$

$$= 12 - 7 - 3 = 2$$