Chapter 7:
Techniques of Integration

Section 7.1:
Integration By Parts

Sec. 7.1: Integration by Parts

The Integration by Parts Formula…

$$\int udv = uv - \int vdu$$

Notes:

- You must be integrating a product to use integration by parts
- You want the new integral to be easier to do than your original integral

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Ex 1: Find $\int xe^x \, dx$

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Ex 2: Find $\int t^3 \sin(t)\, dt$

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Ex 3: Find $\int e^x cos(x)\, dx$

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Ex 4: Find $\int \ln(x)\, dx$

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Ex 5: Find $\int_0^1 sin^{-1}x\, dx$

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Ex 6: Find $\int e^{\sqrt{x}}\, dx$

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Ex 7: Prove the reduction formula

$$\int sin^n(x)\,dx =$$

$$= -\frac{1}{n}\cos(x)\ sin^{n-1}(x) + \frac{n-1}{n}\int sin^{n-2}(x)\,dx$$

where n is an integer and $n \geq 2$.