Integration by Parts, Part II

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Announcements

1. Homework in MyOpenMath
2. Exam corrections due next week Tuesday (turn in on Canvas).

Integration by parts for definite integrals

By the fundamental theorem of calculus, we know that we can find

$$\int_a^b f(x)\, g'(x)\, dx = f(x)\, g(x)\,|_{x=a}^{x=b} - \int_a^b g(x)\, f'(x)\, dx$$

or, using u and v,

$$\int_a^b u\, dv = uv\,|_a^b - \int_a^b v\, du$$

Example

Find

$$\int_0^1 \tan^{-1}(2x)\ dx$$

Example

Example

Find the volume of the solid generated by rotating the region bounded by the curves $y = e^x$, $x = 0$, $y = 0$, and $x = 1$ about the $y-$axis.

Example

Example

Find

$$\int x^3 e^{4x}\, dx$$

Example

Example

Find

$$\int e^x \sin(x)\, dx$$

Example

Example

Find

$$\int x^2 e^{x^2}\, dx$$

Example

Calculate

$$\int xe^{x^2}\,dx$$

Example