

Calculus I

$\int Ae^{ax+b} dx$, part 2

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Example (Substitution Rule)

Find $\int e^{3x} dx$.

Let $u = 3x$.

Then $du = 3dx$

$$dx = \frac{1}{3} du.$$

$$\begin{aligned}\text{Substitute: } \int e^{3x} dx &= \int \frac{1}{3} e^u du \\ &= \frac{1}{3} e^u + C \\ &= \frac{1}{3} e^{3x} + C.\end{aligned}$$