Common Formulas

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$\int e^{ax}dx = \frac{e^{ax}}{a} + C$

$\int xe^x dx \rightarrow$ Integrate by parts using product rule: $\int udv = uv' - \int uvdv$

$\int xe^{x^2} dx \rightarrow$ let $u = x^2, du = 2xdx$

$\int \frac{x^2}{x^2+9}dx = \int \left(\frac{x^2+9}{x^2+9} - \frac{9}{x^2+9}\right)$

$\int \frac{xdx}{x^2+9} \rightarrow$ let $u = x^2 + 9, du = 2xdx$

$\int \frac{dx}{x^2+a^2} = \frac{1}{a}\tan^{-1}\frac{x}{a}$

$\int \sin axdx = \frac{-\cos ax}{a} + C$

$\int \cos axdx = \frac{\sin ax}{a} + C$