Name: _____ **Section:** _____

A short table of integrals

A a constant $\int A dx = Ax + C$,

$n \neq 0, 1 \quad \int x^n dx = \frac{x^{n+1}}{n+1} + C$

$\int \frac{dx}{x} = log(x) + C$; Integration by parts: $\int udv = uv - \int vdu$

$\int e^{ax} dx = \frac{1}{a} e^{ax} + C$; Substitution: $u = u(x),\ \int udu = \int u(x)u'(x)dx$

$\int xe^{ax} dx = e^{ax}(\frac{x}{a} - \frac{1}{a^2}) + C$

$\int x^2 e^{ax} dx = e^{ax}(\frac{x^2}{a} - \frac{2x}{a^2} + \frac{2}{a^3}) + C$

$\int log(ax) = xlog(ax) - x + C$

$\int xlog(ax) = \frac{x^2}{2} log(ax) - \frac{x^2}{4} + C$

$\int \frac{dx}{a^2+x^2} = \frac{1}{a} arctan(\frac{x}{a}) + C$

$\int \frac{dx}{a^2-x^2} = \frac{1}{2a} log(\frac{x+a}{x-a}) + C$

$\int \frac{dx}{\sqrt{a^2-x^2}} = arcsin(\frac{x}{a}) + C$

$\int \frac{dx}{\sqrt{x^2-a^2}} = log(x + \sqrt{x^2 - a^2}) + C$

$\int \frac{dx}{\sqrt{a^2+x^2}} = arcsinh(\frac{x}{a}) + C$

$\int sin(ax) = -\frac{1}{a} cos(ax) + C$

$\int cos(ax) = \frac{1}{a} sin(ax) + C$

$\int tan(ax) = \frac{1}{a} log(sec(ax)) + C$

$\int cot(ax) = \frac{1}{a} log(sin(ax)) + C$

$\int sec(ax) = \frac{1}{a} log(tan(ax) + sec(ax)) + C$

$\int csc(ax) = -\frac{1}{a} log(csc(a * x) + cot(a * x)) + C$

$\int x\ cos(ax) = \frac{x\ sin(ax)}{a} + \frac{cos(ax)}{a^2} + C$

$\int x\ sin(ax) = \frac{sin(ax)}{a^2} - \frac{x\ cos(ax)}{a} + C$