1 | Intergration

Antiderivatives table

Function	Antidervative
x^n	$\frac{x^{n+1}}{n+1} + c, x \neq -1$
$af(x)$	$a * (f(x)dx)$
$\frac{1}{x}$	\(ln(\
x\	)\)
$sin(at)$	$-\frac{cos(t)}{a}$
$cos(at)$	$\frac{sin(t)}{a}$
e^a	e^a
$\frac{1}{1+(ax)^2}$	$tan^{-}1(ax)$
$\frac{a}{\sqrt{k^2-(ax)^2}}$	$sin^{-}1(\frac{ax}{k})$
$\frac{-1}{\sqrt{k^2-(ax)^2}}$	$cos^{-}1(\frac{ax}{k})$
$ln(x)$	$xln(x) - x$ <= remember this
$\int f(x)g'(x)dx$	$f(x)g(x) - \int f'(x)g(x)dx$
Arc Length of function $f(x)$	$\sqrt{1+f'(x)^2dx}$
Arc length of polar function $x(t), y(t)$	$\sqrt{x'(t)^2 + y'(t)^2}(dt)$
$r(\theta)$	$\int_a^B (r(\theta)^2)d\theta$
$sec^2(x)$	$tan(x)$

Also, fun other things

Function	Other Function
$\cos 2\theta$	$1 - 2sin^2\theta$
$\cos 2\theta$	$2cos^2\theta - 1$
$sec^2x - 1$	tan^2x

1.1 | Some Limits Too!

$\lim_{\theta \to \infty} tan^{-1}(\theta) = \frac{\pi}{2}$

With the reverse product rule, try to make f(x) the simpler derivative, and g(x) the simpler antiderivative

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1.2 | Useful thing

- Intergration by Parts (reverse product rule) (the f(x)g'(x) rule above)
- u-Substitution (reverse chain rule)
- Compleeting the Square + arcsin/arctan
- Long divide, then intergrate