Derivatives

$D_x(e^x) = e^x$

$D_x(\ln x) = \frac{1}{x}$

$D_x(x^a) = ax^{a-1}$

$D_x(a^x) = (\ln a)a^x$

$D_x(\sin x) = \cos x$

$D_x(\cos x) = -\sin x$

$D_x(\tan x) = \sec^2 x$

$D_x(\cot x) = -\csc^2 x$

$D_x(\sec x) = \sec x \tan x$

$D_x(\csc x) = -\csc x \cot x$

$D_x(\sin^{-1} x) = \frac{1}{\sqrt{1-x^2}}, x \in (-1,1)$

$D_x(\cos^{-1} x) = \frac{-1}{\sqrt{1-x^2}}, x \in (-1,1)$

$D_x(\tan^{-1} x) = \frac{1}{1+x^2}$

$D_x(\sec^{-1} x) = \frac{1}{|x|\sqrt{x^2-1}}, |x| > 1$

More Derivatives

$D_x(\sinh x) = \cosh x$

$D_x(\cosh x) = \sinh x$

$D_x(\csc hx) = -\csc hx \coth x$

$D_x(\tanh x) = \sec h^2 x$

$D_x(\sec hx) = -\sec hx \tanh x$

$D_x(\coth x) = -\csc h^2 x$

$D_x(\sinh^{-1} x) = \frac{1}{\sqrt{x^2+1}}$

$D_x(\cosh^{-1} x) = \frac{1}{\sqrt{x^2-1}}, x > 1$

$D_x(\tanh^{-1} x) = \frac{1}{1-x^2}, -1 < x < 1$

$D_x(\sec h^{-1} x) = \frac{-1}{x\sqrt{1-x^2}}, 0 < x < 1$

Miscellaneous

$\lim_{h \to 0}(1+h)^{1/h} = e$

To solve $\frac{dy}{dx} + P(x)y = Q(x)$, multiply both sides by $e^{\int P(x)dx}$ and solve.