GDB Cheatsheet

Calculus (Differentiation)

Differentiation Rules

$$\frac{\mathrm{d}}{\mathrm{dx}}(u \pm v) = \frac{(\mathrm{du})}{\mathrm{dx}} \pm \frac{(\mathrm{dv})}{\mathrm{dx}}$$

$$\frac{\mathrm{d}}{\mathrm{dx}}(uv) = u\frac{(\mathrm{dv})}{\mathrm{dx}} + v\frac{(\mathrm{du})}{\mathrm{dx}}$$

$$\frac{\mathrm{d}}{\mathrm{dx}}\left(\frac{u}{v}\right) = \frac{v\frac{(\mathrm{du})}{\mathrm{dx}} - u\frac{(\mathrm{dv})}{\mathrm{dx}}}{v^2}$$

$$\frac{\mathrm{d}}{\mathrm{dx}}[cf(x)] = c * \frac{\mathrm{d}}{\mathrm{dx}}[f(x)]$$

Power & Exponential Rules

$$\frac{\mathrm{d}}{\mathrm{dx}}(x^n) = nx^{n-1}$$
$$\frac{\mathrm{d}}{\mathrm{dx}}(x) = 1$$
$$\frac{\mathrm{d}}{\mathrm{dx}}(c) = 0$$
$$\frac{\mathrm{d}}{\mathrm{dx}}(e^x) = e^x$$
$$\frac{\mathrm{d}}{\mathrm{dx}}(e^{\mathrm{mx}}) = me^{\mathrm{mx}}$$
$$\frac{\mathrm{d}}{\mathrm{dx}}(a^x) = a^x \ln a$$
$$\frac{\mathrm{d}}{\mathrm{dx}}(\ln x) = \frac{1}{x}$$
$$\frac{\mathrm{d}}{\mathrm{dx}}(\log_a x) = \frac{1}{x \ln a}$$

Trigonometric Rules

$$\frac{\mathrm{d}}{\mathrm{dx}}(\sin x) = \cos x$$

$\frac{\mathrm{d}}{\mathrm{dx}}(\cos x) = -\sin x$
$\frac{\mathrm{d}}{\mathrm{dx}}(\tan x) = \sec^2 x$
$\frac{\mathrm{d}}{\mathrm{dx}}(\cot x) = -\csc^2 x$
$\frac{\mathrm{d}}{\mathrm{dx}}(\sec x) = \sec x \tan x$
$\frac{\mathrm{d}}{\mathrm{dx}}(\csc x) = -\csc x \cot x$

Inverse Trigonometric Rules

$\frac{\mathrm{d}}{\mathrm{dx}}(\sin^- 1x) = \frac{1}{\sqrt{1-x^2}}$
$\frac{\mathrm{d}}{\mathrm{dx}}(\cos^- 1x) = -\frac{1}{\sqrt{1-x^2}}$
$\frac{\mathrm{d}}{\mathrm{dx}}(\tan^- 1x) = \frac{1}{1+x^2}$
$\frac{\mathrm{d}}{\mathrm{dx}}(\cot^- 1x) = -\frac{1}{1+x^2}$
$\frac{\mathrm{d}}{\mathrm{dx}}(\sec^- 1x) = \frac{1}{|x|\ \sqrt{x^2-1}}$
$\frac{\mathrm{d}}{\mathrm{dx}}(\csc^- 1x) = -\frac{1}{|x|\ \sqrt{x^2-1}}$