Let $n \in \mathbf{R}$ and let $a \in \mathbf{R}$. Let x be the independent variable and let u and v be dependent variables. Where every both u and $v$are differentiable, we have

Rule #0 (constant rule) $\frac{\mathrm{d}}{\mathrm{d}x}[a] = 0$

Rule #1 (power rule) $\frac{\mathrm{d}}{\mathrm{d}x}[x^n] = nx^{n-1}$. When $n = 1$, the rule is $\frac{\mathrm{d}}{\mathrm{d}x}[x] = 1$.

Rule #2 (outative rule) $\frac{\mathrm{d}}{\mathrm{d}x}[au] = a\frac{\mathrm{d}u}{\mathrm{d}x}$.

Rule #3 (additive rule) $\frac{\mathrm{d}}{\mathrm{d}x}[u+v] = \frac{\mathrm{d}u}{\mathrm{d}x} + \frac{\mathrm{d}v}{\mathrm{d}x}$.

Rule #4 (product rule) $\frac{\mathrm{d}}{\mathrm{d}x}[uv] = \frac{\mathrm{d}u}{\mathrm{d}x}v + u\frac{\mathrm{d}v}{\mathrm{d}x}$

Rule #5 (quotient rule) $\frac{\mathrm{d}}{\mathrm{d}x}\left[\frac{u}{v}\right] = \frac{v\frac{\mathrm{d}u}{\mathrm{d}x} - u\frac{\mathrm{d}v}{\mathrm{d}x}}{v^2}$

Rule #6 (exponential rule) $\frac{\mathrm{d}}{\mathrm{d}x}[\mathrm{e}^x] = \mathrm{e}^x$

Rule #7 (absolute value rule) $\frac{\mathrm{d}}{\mathrm{d}x}[|x|] = \begin{cases} -1 & x < 0 \\ 1 & x > 0 \end{cases}$. The absolute value function is *not* differentiable at zero.

Notice: The product and quotient rules require that both factors are differentiable. When either fails to be differentiable, anything can happen.