

Rules of Differentiation

- 1) $D_x^n = nx^{n-1}$ (Power Rule)
- 2) if $f(x) = c \Rightarrow f'(x) = 0$
- 3) if $f(x) = mx + b \Rightarrow f'(x) = m$
- 4) $D[f(x) \pm g(x)] = f'(x) \pm g'(x)$
- 5) $D[cf(x)] = c \cdot f'(x)$
- 6) $D[f(x) \cdot g(x)] = f'(x)g(x) + f(x)g'(x)$ (Product Rule)
- 7) $D\left[\frac{f(x)}{g(x)}\right] = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$ (Quotient Rule)
- 8) $D e^x = e^x$
- 9) $D \ln x = \frac{1}{x}$

where $c, m, & b$ are constants,
and $f(x) & g(x)$ are functions.