

SUMMARY OF DIFFERENTIATION RULES

① **Constant Rule:** $\frac{d}{dx}(c) = 0$ (c is a constant)

② **Power Rule:** $\frac{d}{dx}(x^n) = n x^{n-1}$ (n is a const)

③ **Constant Multiple Rule:** $\frac{d}{dx}[c \cdot f(x)] = c \cdot f'(x)$ (c is a const)

④ **Sum and Difference Rules** $\frac{d}{dx}[f(x) \pm g(x)] = f'(x) \pm g'(x)$

⑤ **Product Rule** $\frac{d}{dx}[f(x) \cdot g(x)] = f(x) \cdot g'(x) + f'(x) \cdot g(x)$

⑥ **Quotient Rule** $\frac{d}{dx}\left[\frac{f(x)}{g(x)}\right] = \frac{g(x) \cdot f'(x) - f(x) \cdot g'(x)}{[g(x)]^2}$

⑦ **Derivatives of Trig Functions**

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

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

$\frac{d}{dx}(\tan x) = \sec^2 x$

$\frac{d}{dx}(\cot x) = -\operatorname{cosec}^2 x$

$\frac{d}{dx}(\sec x) = \sec x \cdot \tan x$

$\frac{d}{dx}(\operatorname{cosec} x) = -\operatorname{cosec} x \cdot \cot x$