

IMPORTANT DERIVATIVES FORMULAS

$$1. \frac{d}{dx}(c) = 0$$

$$2. \frac{d}{dx}(x) = 1$$

$$3. \frac{d}{dx}(x^n) = nx^{n-1}$$

$$4. \frac{d}{dx}(\sin x) = \cos x$$

$$5. \frac{d}{dx}(\cos x) = -\sin x$$

$$6. \frac{d}{dx}(\tan x) = \sec^2 x$$

$$7. \frac{d}{dx}(\cot x) = -\operatorname{cosec}^2 x$$

$$8. \frac{d}{dx}(\sec x) = \sec x \tan x$$

$$9. \frac{d}{dx}(\operatorname{cosec} x) = -\operatorname{cosec} x \cot x$$

$$10. \frac{d}{dx}(\sin^{-1} x) = \frac{1}{\sqrt{1-x^2}}$$

$$11. \frac{d}{dx}(\cos^{-1} x) = \frac{-1}{\sqrt{1-x^2}}$$

$$12. \frac{d}{dx}(\tan^{-1} x) = \frac{1}{1+x^2}$$

$$13. \frac{d}{dx}(\cot^{-1} x) = \frac{-1}{1+x^2}$$

$$14. \frac{d}{dx}(\sec^{-1} x) = \frac{1}{x\sqrt{x^2-1}}$$

$$15. \frac{d}{dx}(\operatorname{cosec}^{-1} x) = \frac{-1}{x\sqrt{x^2-1}}$$

$$16. \frac{d}{dx}(\ln x) = \frac{1}{x}$$

$$17. \frac{d}{dx}(a^x) = a^x \ln a$$

$$18. \frac{d}{dx}(e^x) = e^x$$

$$19. \frac{dy}{dx} = \frac{dy}{dt} \times \frac{dt}{dx} \quad \left\{ \begin{array}{l} \text{Chain} \\ \text{Rule} \end{array} \right\}$$

$$20. \frac{d}{dx}[f(x)g(x)] = \left(\frac{d}{dx}f(x)\right)g(x) + f(x)\left(\frac{d}{dx}g(x)\right) \quad \left\{ \begin{array}{l} \text{Product} \\ \text{Rule} \end{array} \right\}$$

$$21. \frac{d}{dx}\left[\frac{f(x)}{g(x)}\right] = \frac{g(x)\left(\frac{d}{dx}f(x)\right) - f(x)\left(\frac{d}{dx}g(x)\right)}{[g(x)]^2} \quad \left\{ \begin{array}{l} \text{The} \\ \text{Quotient} \\ \text{Rule} \end{array} \right\}$$

