

8.4 Table of Derivatives

Independent variable: x Real constants: C, a, b, c Natural number: n

$$775. \quad \frac{d}{dx}(C) = 0$$

$$776. \quad \frac{d}{dx}(x) = 1$$

$$777. \quad \frac{d}{dx}(ax + b) = a$$

$$778. \quad \frac{d}{dx}(ax^2 + bx + c) = 2ax + b$$

$$779. \quad \frac{d}{dx}(x^n) = nx^{n-1}$$

$$780. \quad \frac{d}{dx}(x^{-n}) = -\frac{n}{x^{n+1}}$$

$$781. \quad \frac{d}{dx}\left(\frac{1}{x}\right) = -\frac{1}{x^2}$$

$$782. \quad \frac{d}{dx}(\sqrt{x}) = \frac{1}{2\sqrt{x}}$$

$$783. \quad \frac{d}{dx}(\sqrt[n]{x}) = \frac{1}{n\sqrt[n]{x^{n-1}}}$$

$$784. \quad \frac{d}{dx}(\ln x) = \frac{1}{x}$$

$$785. \quad \frac{d}{dx}(\log_a x) = \frac{1}{x \ln a}, \quad a > 0, \quad a \neq 1.$$

$$786. \quad \frac{d}{dx}(a^x) = a^x \ln a, \quad a > 0, \quad a \neq 1.$$

$$787. \quad \frac{d}{dx}(e^x) = e^x$$

$$788. \quad \frac{d}{dx}(\sin x) = \cos x$$

$$789. \quad \frac{d}{dx}(\cos x) = -\sin x$$

$$790. \quad \frac{d}{dx}(\tan x) = \frac{1}{\cos^2 x} = \sec^2 x$$

$$791. \quad \frac{d}{dx}(\cot x) = -\frac{1}{\sin^2 x} = -\csc^2 x$$

$$792. \quad \frac{d}{dx}(\sec x) = \tan x \cdot \sec x$$

$$793. \quad \frac{d}{dx}(\csc x) = -\cot x \cdot \csc x$$

$$794. \quad \frac{d}{dx}(\arcsin x) = \frac{1}{\sqrt{1-x^2}}$$

$$795. \quad \frac{d}{dx}(\arccos x) = -\frac{1}{\sqrt{1-x^2}}$$

$$796. \quad \frac{d}{dx}(\arctan x) = \frac{1}{1+x^2}$$

$$797. \frac{d}{dx}(\operatorname{arccot} x) = -\frac{1}{1+x^2}$$

$$798. \frac{d}{dx}(\operatorname{arcsec} x) = \frac{1}{|x|\sqrt{x^2-1}}$$

$$799. \frac{d}{dx}(\operatorname{arccsc} x) = -\frac{1}{|x|\sqrt{x^2-1}}$$

$$800. \frac{d}{dx}(\sinh x) = \cosh x$$

$$801. \frac{d}{dx}(\cosh x) = \sinh x$$

$$802. \frac{d}{dx}(\tanh x) = \frac{1}{\cosh^2 x} = \operatorname{sech}^2 x$$

$$803. \frac{d}{dx}(\operatorname{coth} x) = -\frac{1}{\sinh^2 x} = -\operatorname{csch}^2 x$$

$$804. \frac{d}{dx}(\operatorname{sech} x) = -\operatorname{sech} x \cdot \tanh x$$

$$805. \frac{d}{dx}(\operatorname{csch} x) = -\operatorname{csch} x \cdot \operatorname{coth} x$$

$$806. \frac{d}{dx}(\operatorname{arcsinh} x) = \frac{1}{\sqrt{x^2+1}}$$

$$807. \frac{d}{dx}(\operatorname{arccosh} x) = \frac{1}{\sqrt{x^2-1}}$$

$$808. \quad \frac{d}{dx}(\operatorname{arctanh} x) = \frac{1}{1-x^2}, \quad |x| < 1.$$

$$809. \quad \frac{d}{dx}(\operatorname{arccoth} x) = -\frac{1}{x^2-1}, \quad |x| > 1.$$

$$810. \quad \frac{d}{dx}(u^v) = v u^{v-1} \cdot \frac{du}{dx} + u^v \ln u \cdot \frac{dv}{dx}$$