Differentiation Formulas from Calculus

$$1.\ [a]' = 0,\ (a = \text{constant})$$

$$2.\ [x^n]' = nx^{n-1}$$

$$3.\ [f(x) \pm g(x)]' = f'(x) \pm g'(x)$$

$$4.\ [af(x)]' = af'(x),\ a = \text{constant}$$

$$5.\ [f(x) \cdot g(x)]' = f'(x) \cdot g(x) + f(x) \cdot g'(x)$$

$$6.\ \left[\frac{f(x)}{g(x)}\right]' = \frac{g(x)f'(x) - g'(x)f(x)}{g(x)^2}$$

(**#5** is known as the **Product Rule**, and **#6** is known as the **Quotient Rule**. **#6** can be derived from **#5**.)

$$7.\ [f(g(x))]' = f'(g(x)) \cdot g'(x) \quad \text{(Chain Rule)}$$

$$8.\ [f^{-1}(x)]' = 1/[f'(f^{-1}(x))]$$

$$9.\ [\sin u(x)]' = [\cos u(x)] \cdot u'(x)$$

$$10.\ [\cos u(x)]' = [-\sin u(x)] \cdot u'(x)$$

$$11.\ [\tan u(x)]' = [\sec^2 u(x)] \cdot u'(x)$$

$$12.\ [\cot u(x)]' = [-\csc^2 u(x)] \cdot u'(x)$$

$$13.\ [\sec u(x)]' = [\sec u(x) \cdot \tan u(x)] \cdot u'(x)$$

$$14.\ [\csc u(x)]' = [-\cot u(x) \cdot \csc u(x)] \cdot u'(x)$$

$$15.\ [e^{u(x)}]' = e^{u(x)} \cdot u'(x)$$

$$16.\ [\ln u(x)]' = [1/u(x)] \cdot u'(x)$$

If you are having difficulty understanding these formulas or any other formulas in mathematics, call Michael Ragusa at (703) 691-2730*;* send him an E-mail message at mathdepot@hotmail.com; or visit his website: www.mathdepot.com. You'll be glad you did!