

Differentiation Rules

From Section 3-4:

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

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

$$3. \frac{d}{dx}(k f(x)) = k f'(x)$$

$$4. \frac{d}{dx}(f(x) \pm g(x)) = f'(x) \pm g'(x)$$

From Section 3-5:

$$5. \frac{d}{dx} (F(x) \cdot S(x)) = F(x)S'(x) + F'(x)S(x)$$

$$6. \frac{d}{dx} \left(\frac{T(x)}{B(x)} \right) = \frac{B(x)T'(x) - T(x)B'(x)}{[B(x)]^2}$$

From Section 3-6:

$$7. \frac{d}{dx} \left([f(x)]^n \right) = n[f(x)]^{n-1} f'(x)$$

From Section 5-2:

$$8. \frac{d}{dx}(e^x) = e^x$$

$$9. \frac{d}{dx}(\ln x) = \frac{1}{x}$$

From Section 5-3:

$$10. \frac{d}{dx}(e^{f(x)}) = e^{f(x)} f'(x)$$

$$11. \frac{d}{dx}(\ln(f(x))) = \frac{1}{f(x)} f'(x) = \frac{f'(x)}{f(x)}$$