SECTION 3-3: DERIVATIVE RULES

Read Section 3.2. Work the embedded problems.

1. Fill in the following rules:

   (a) $\dfrac{d}{dx}[c] =$

   (b) $\dfrac{d}{dx}[x^n] =$

   (c) $\dfrac{d}{dx}[c\,f(x)] =$

   (d) $\dfrac{d}{dx}[f(x) + g(x)] =$

2. Apply the rules to find the derivative of:

   (a) $f(x) = e^3$

   (b) $f(x) = x^{-4}$

   (c) $H(x) = 4x^{1/2}$

   (d) $j(x) = \dfrac{\sqrt{2}}{2} + x - x^{2.3}$

3. Fill in the following rules:

   (a) $\dfrac{d}{dx}[f(x)\,g(x)] =$

   (b) $\dfrac{d}{dx}\left[\dfrac{f(x)}{g(x)}\right] =$

4. Find the derivative of each of the following:

   (a) $H(x) = (3x^2 + 1)(\frac{1}{x} + x)$

   (b) $G(x) = \frac{x^2}{x^2+1}$

5. Notation:

6. Higher order derivatives

   Example: $y = x^3 - 2\sqrt{x} + \pi$

7. The vertical height of an object is given by $s(t) = -16t^2 + 20t + 100$. Find $s'(t)$ and $s''(t)$. Include units.