Math 131 - February 15, 2015

Warm-up Problems

1. What is the derivative?
2. What is the limit definition of derivative?
3. What rules/formulas do we have for finding derivatives?
4. Find the equation of the line tangent to $y = \sqrt{x}$ at $x = 4$.

Lecture Problems

5. Find the following derivatives

   (a) $\frac{d}{dx}(4e^x + 2x) =$

   (b) $\frac{d}{dx}(13x^2 + 5e^x) =$

   (c) $\frac{d}{dx}(12xe^x) =$

   (d) $\frac{d}{dx}(12e^{2x} - 4x) =$

6. Use the product rule to find the derivatives.

   (a) $f(x) = (x^2 - 2)(x^3 + 2x)$

   (b) $y = x^3e^x$

   (c) $f(x) = x^2e^x$. Find $f''(x)$ and $f'''(x)$.

7. Use the quotient rule to find the derivatives.

   (a) $f(x) = \frac{x^2-2}{x^3+2x}$

   (b) $y = \frac{x}{e^x}$

   (c) $f(x) = \frac{x^2}{e^x}$

   (d) $f(x) = xe^{-x}$