Reading Outline, §3.1–§3.2

Vocabulary/Definitions

- The effect of a constant multiple of a function on its derivative
- $(cf(x))' =$
- $(f(x) + g(x))' =$
- The power rule: $\frac{d}{dx}(x^n) =$
- The derivation of $(x^{-2})' = -2x^{-3}$ from the limit definition of f'(x)
- Why $(a^x)'$ must resemble a^x
- $\frac{d}{dx}(e^x) =$
- $\frac{d}{dx}(a^x) =$

Understand

1. Find the derivative of $f(x) = 3x^3 - 2\sqrt{x}$.

2. If the height of a thrown ball is $h(t) = -4.9t^2 + 25t + 5$, find its velocity and acceleration.

3. Estimate $\lim_{h \to 0}(1 + h)^{1/h}$. Does it converge to $e = 2.718281828$? Explain why or why not.

4. Differentiate $g(x) = 4 \cdot 7^x - 2 \cdot x^7$.