Written Assignment 2

MATH2144, Fall 2018

due Friday, the 14^{th} of September

This assignment is out of eight points. The first question is worth four points. The last question's parts are worth two points each.

1. Calculate the derivative

$$\frac{d}{dx}\left(x^4\right)$$

using the limit definition of the derivative.

- 2. Suppose f is differentiable at x.
 - (a) Use the composition law for limits on neg(h) = -h to show that

$$\lim_{h \to 0} \frac{f(x) - f(x - h)}{h} = f'(x).$$

(b) Add the definition of derivative to the previous part to show that

$$\lim_{h \to 0} \frac{f(x+h) - f(x-h)}{2 \cdot h} = f'(x).$$

Formula 2b is how TI-83 and TI-84 calculators estimate derivatives.