

Homework 2

1. Using the definition only, compute the derivatives of the following functions

$$f(x) = -x^2 \quad \text{at } c = 2,$$

$$g(t) = 3t^2 \quad \text{at every } c,$$

$$h(x) = \frac{1}{x} \quad \text{at every } c,$$

$$F(s) = \sqrt{5s} \quad \text{at every } c.$$

2. Using the rules of differentiation, compute the derivatives of the following functions

$$r(t) = t^2 - \frac{1}{t^2} + \frac{5}{t^4},$$

$$s(x) = \frac{1}{2\sqrt{x}} + \frac{x^2}{4},$$

$$f(x) = \frac{3x + 5}{x + 9},$$

$$h(x) = \frac{2x^5 - 3x^2 + 11}{x^3}.$$

3. Compute the second order and the third order derivatives of the functions

$$f(x) = \frac{1}{4}x^8 - \frac{1}{2}x^6 - x^2 + 2$$

$$f(x) = \frac{1}{\sqrt{x}}.$$

4. Find the equation of the line tangent to the graph of the function at the specified point:

$$f(x) = x^3 \quad \text{at } (-1/2, -1/8),$$

$$g(x) = \frac{1}{x + 3} \quad \text{at } (2, 1/5).$$