

Math 165: Honors Calculus I
Assignment 23 Nov. 13, 1998

1. Use the definition of the derivative to find the derivative of the following functions at any point in their domains.

a) $f(x) = \frac{1}{x^n}$

b) $f(x) = \sqrt{x+1}$

c) $f(x) = \frac{x-1}{x+1}$

2. Let

$$f(x) = \begin{cases} \frac{\sin(5x^2)}{x} & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$$

Use the definition of the derivative to show $f'(0) = 5$.