

Calculus: Inclass Homework 2

October 4th, 2007

1. Consider the function

$$f(x) = \begin{cases} x^2, & \text{if } x \leq 1; \\ 2 - x, & \text{if } x > 1. \end{cases}$$

Explain how to use the limit laws to compute $\lim_{x \rightarrow a} f(x)$ for all real numbers a .

2. Assume that $\lim_{x \rightarrow a} f(x) = \infty$ and $\lim_{x \rightarrow a} g(x) = -\infty$.

- (a) Use the precise definition of the limit to prove that $\lim_{x \rightarrow a} f(x)g(x) = -\infty$.
(b) Show that no conclusion can be made about $\lim_{x \rightarrow a} (f(x) + g(x))$.