

## 109 Spring 2011 - Homework Exercise 3

### Addendum on Continuity

Due 4/18

**Exercise.** Consider the function

$$f(x) = \begin{cases} \frac{x^2-1}{x-1} & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$$

- (a) Prove, using the definition of limit from lecture, that  $\lim_{x \rightarrow 0} f(x) = 1$ .
- (b) Prove, using the definition of continuity from lecture, that  $f(x)$  is not continuous at 0.