

name: Solution

1 (10 points). Determine whether the following statement

"The value of  $\lim_{x \rightarrow a} f(x)$  does not exist if  $f(a)$  is undefined"  
is true or false. If true, provide an explanation. If false, provide a counterexample.

False. Consider the function

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

Then  $f(1)$  is undefined but

$$\lim_{x \rightarrow 1} f(x) = \lim_{x \rightarrow 1} (x+1) = 2.$$

The graph of  $f$  is

