Differentiate Abs(x) Problem Set Writeup

The question posed was to find the tangent line of $f(x) = |x|$ when $x = 0$. In other words we were to find $f'(0)$. Though there is clearly a slope on either side of zero, I was unable to come to a satisfactory answer. I found that the answer could either be one, or undefined depending on what the limit of x was set to. The solution set implies that negative one would also be possible. The problem is that the limit of x is not well defined enough to answer the question.

For the sake of practice, the graph of f(x) is presented below.