MATH 131, Fall 2019 Name: _____

Quiz 3

09/26/19 Section:_____

For full credit you must present a clearly organized solution, showing all supporting calculations. This quiz has two sides!

1. Use *the limit definition* of the derivative to find $f'(x)$ for

$$f(x) = 2 + 4x - x^2 \, .$$

2. Find values of m and b such that the function

$$g(x) = \begin{cases} 2 + 4x - x^2 & \text{if } x \geq 0 \\ mx + b & \text{if } x < 0 \end{cases}$$

is differentiable when $x = 0$. You may use the results of the first question, but should still carefully justify differentiability of g at $x = 0$ by appealing to appropriate definitions or theorems.