

Math 151**Quiz 3**

Justify all answers with neat and organized work. Clearly indicate your answers.
10 points possible.

1. (5 pts.) The *signum* (or sign) function, denoted by sgn , is defined by

$$\text{sgn } x = \begin{cases} -1 & \text{if } x < 0 \\ 0 & \text{if } x = 0 \\ 1 & \text{if } x > 0 \end{cases}$$

Find each of the following limits or explain why it does not exist.

(a) $\lim_{x \rightarrow 0^+} \text{sgn } x$

(b) $\lim_{x \rightarrow 0^-} \text{sgn } x$

(c) $\lim_{x \rightarrow 0} \text{sgn } x$

2. (5 pts.) Use the slope equation

$$m = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

to find an equation of the tangent line to the curve $y = 1/x^2$ at the point $(3, \frac{1}{9})$.