STUDENT NAME:

Calculus 1550, section 6. Thursday, January 29, 2004. Second quiz.

Let

$$f(x) = \frac{9 - x^2}{x(3 - x)}.$$

1. [2 point] What is the domain of $f(x)$? $\mathbb{R} \setminus \{0, 3\} = (-\infty, 0) \cup (0, 3) \cup (3, \infty)$

2. [6 points] **EITHER:** Factor the numerator of $f(x)$, and write a simpler expression for $f(x)$, which is valid for all x in the domain of $f(x)$.

$$\frac{9-x^2}{x(3-x)} = \frac{(3-x)(3+x)}{x(3-x)} = \frac{3+x}{x} \quad \text{for } x \neq 3$$

you only need to do one of these parts.

OR: Fill in the values of $f(x)$ in the following table.

x	$f(x)$
2	$\frac{9-4}{2\times 1} = 2.5$
2.5	$\frac{9-6.25}{2.5\times 0.5} = 2.2$
2.9	$\frac{9-8.41}{2.9\times 0.1} \approx 2.034$

3. [2 point] From your answer to part 2, complete the following:

$$\lim_{x \to 3} f(x) = 2$$

(because $\frac{3+x}{x} = \frac{3+3}{3} = 2$ if $x = 3$, or values in table get close to 2.