Quiz #2

Name: _____

Math 105-A (Salomone)

February 2, 2009

Show all your work!

Score (25 points possible): ☐

Problem 1. (12 points) Consider the three functions

$$f(x) = \sin x - 2x + 2 \qquad g(x) = 3^x - 2x \qquad h(x) = 4x^3 + x - 10$$

(a) (6 points) Compute:

(i) $f'(x) =$

(ii) $g'(x) =$

(iii) $h'(x) =$

(b) (6 points) Only one of these three functions has a stationary point. Which one, and why?

You may include a graph if you wish, but be sure to justify your answer using algebra.

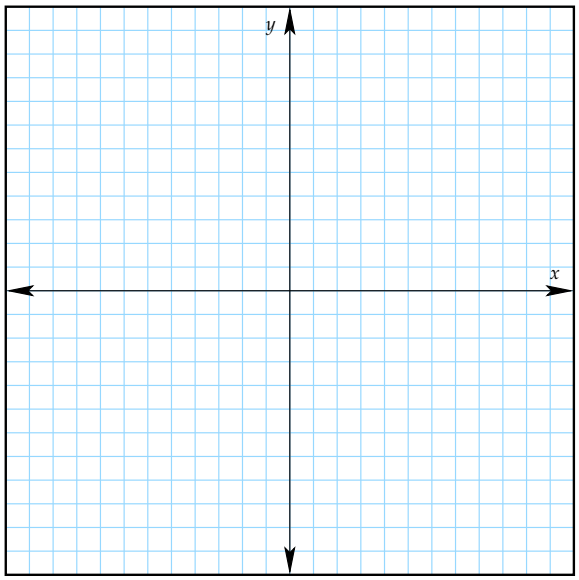
Problem 2. (9 points) Compute the limits

$$\lim_{x\to 2} \frac{x-2}{x^2-5x+6} \qquad \text{and} \qquad \lim_{x\to 2} \frac{x-3}{x^2-5x+6} \quad .$$

In one or two sentences, explain why these two limits are so different, even though their denominators both approach zero.

Problem 3. (4 points) Let f be a function which is *continuous everywhere except at* $x = 4$. On the axes below, sketch a possible graph of f if it satisfies the given conditions.

(a) (2 points) $\lim_{x\to 4} f(x)$ exists, but does not equal $f(4)$.



(b) (2 points) $\lim_{x\to 4} f(x)$ does not exist, but $f(4)$ does.