STUDENT NAME:

Calculus 1550, section 6. Wednesday, February 4, 2004. Fourth quiz.

The graph of the following function is sketched below:

$$f(x) = \frac{11x + 10}{4(x+2)}$$

Remark: inverse function is $f^{-1}(x) = \frac{8x - 10}{-4x + 11}$ but I don't expect you to compute this!

1. [1 points] If $f(a) = 2$, what is a? **a = 2** (this can be read off graph. check: $\frac{11\times 2 + 10}{4(2+2)} = \frac{22+10}{4\times 4} = \frac{32}{16} = 2$)

2. [1 points] Sketch the three lines $y = 2$, $y = 2 - (1/4)$ and $y = 2 + (1/4)$ on the graph.

3. [2 points] What is the minimum (positive) value of x such that $|f(x) - 2| \le 0.25$? **x = 1** (this is read off graph: check: $f(1) = \frac{11+10}{4\times 3} = \frac{21}{4\times 3} = \frac{7}{4} = 3\frac{1}{4} = 3.75$)

4. [2 points] What is the maximum positive value of x such that $|f(x) - 2| \le 0.25$? **x = 4** (read off graph; check: $f(4) = \frac{44+10}{4\times 6} = \frac{54}{4\times 6} = \frac{9}{4} = 2\frac{1}{4}$)

5. [2 points] Write down the set of all positive values of x where $|f(x) - 2| < 0.25$. **(1, 4)**

6. [2 points] Write a number $\delta > 0$ such that $|f(x) - 2| < 0.25$ whenever $|x - a| < \delta$

$|2-1| = 1$, $|2-4| = 2$, $\min(1,2) = 1$ so $\delta = 1$

(any other δ, with $0 < \delta < 1$ also is correct)