Math 113 Calculus
Quiz 1
27 October 2003 Monday

Question 1) Calculate $\lim_{x\to 1} \dfrac{x^2-3x+2}{x^2-4x+3}$.

Solution:

$$\begin{aligned}\lim_{x\to 1} \frac{x^2-3x+2}{x^2-4x+3} &= \lim_{x\to 1} \frac{(x-1)(x-2)}{(x-1)(x-3)} \\ &= \lim_{x\to 1} \frac{(x-2)}{(x-3)} = \frac{1}{2}.\end{aligned}$$

Question 2) For the real numbers a and b define a function as

$$f(x) = \begin{cases} x^2 & x \leq 2, \\ ax+b & x > 2. \end{cases}$$

Find all values of a and b which render f continuous at $x = 2$.

Solution: For continuity we must have right and left limits at $x = 2$ to be equal. This gives rise to the equation $2a+b = 4$. Hence all values of a and b with $2a+b = 4$ renders f continuous at $x = 2$.