Math 165 (Chris Kurth)
Spring 2008
Quiz 1 Solutions

Show all work. Answers without work will not receive credit.

1. Evaluate:
$$\lim_{x\to 2} \frac{x^2-5x+6}{x-2}.$$

   Solution:

$$\begin{aligned}\lim_{x\to 2} \frac{x^2-5x+6}{x-2} &= \lim_{x\to 2} \frac{(x-2)(x-3)}{(x-2)} \\ &= \lim_{x\to 2} (x-3) \\ &= -1\end{aligned}$$

2. Evaluate:
$$\lim_{x\to 1^-} \frac{\sqrt{1+x}}{4+4x}$$

   Solution:

$$\begin{aligned}\lim_{x\to 1^-} \frac{\sqrt{1+x}}{4+4x} &= \lim_{x\to 1} \frac{\sqrt{1+x}}{4+4x} \\ &= \frac{\sqrt{1+1}}{4+4\cdot 1} \\ &= \frac{\sqrt{2}}{8}\end{aligned}$$

3. Evaluate using the limit theorems, showing each step (i.e., not just by substitution):
$$\lim_{x\to 2} \left(2x^2-3x+1\right)$$

   Solution:

$$\begin{aligned}\lim_{x\to 2} \left(2x^2-3x+1\right) &= \lim_{x\to 2} \left(2x^2\right) - \lim_{x\to 2} (3x) + \lim_{x\to 2} (1) \\ &= 2\lim_{x\to 2} (x)^2 - 3\lim_{x\to 2} (x) + \lim_{x\to 2} (1) \\ &= 2\cdot 2^2 - 3\cdot 2 + 1 \\ &= 3\end{aligned}$$