11am

Quiz 3

Fall 2012 **Your name:** _____

Math 0220 **Your TA's name:** _____

No calculators, no notes, no books. Show all your work (no work = no credit). Write neatly. Simplify your answers.

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1. [10 points] Evaluate the limit $\lim_{x \to 0} \dfrac{\sqrt{4+x} - 2}{x}$, if it exists.

2. [10 points] Is the function

$$f(x) = \begin{cases} \cos x & \text{if} \quad x < \pi/4 \\ \sin x & \text{if} \quad \pi/4 \leq x < \pi/2 \\ \cos x & \text{if} \quad x \geq \pi/2 \end{cases}$$

continuous on $(-\infty, \infty)$. If it is not, then find points at which it is discontinuous. Provide the full explanation.

bonus problem [5 points extra] Does the function

$$f(x) = \frac{x^3 + 27}{x + 3}$$

have a removable discontinuity at $x = -3$? If the discontinuity is removable, then find a continuous everywhere function g that agrees with f for $x \neq -3$.