10am

Quiz 2

Spring 2012 **Your name:** _____

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

No calculators. Show all your work (no work = no credit). Write neatly.

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1. [5 points] Evaluate the limit, if it exists. If it does not exist explain why.

$$\lim_{x \to \infty} \cos 2x$$

2. [5 points] Is the function

$$h(x) = \begin{cases} \dfrac{x^2 - x}{x^2 - 1} & \text{if} \quad x \neq 1 \\ 1 & \text{if} \quad x = 1 \end{cases}$$

continuous or discontinuous at $a = 1$? Show why it is continuous (or discontinuous) at this point.

3. [5 points] Using the definition of the derivative find $f'(a)$ if $f(x) = x^2 - 5x$.

bonus problem [5 points extra] Show that any line of nonzero slope that passes through the point $(0, 1)$ must intersect the graph of $\sin x$ at least once.