11am

Quiz 2

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.

---

1. (a) [4 points] The functions $F(x) = \sec\left(\left(x^2-4\right)^{-1/3}\right)$ can be expressed in the form $f \circ g \circ h$. Find $f(x)$, $g(x)$, and $h(x)$.

(b) [3 points] What is the domain of $g \circ h$?

2. [7 points] Sketch the graph of an example of a function $g(x)$ if it has the domain $[-2, 6)$ and satisfies all the given conditions. Mark all important points on the graph and the axes.

$$g(-2) = 1, \quad \lim_{x\to 0^-} g(x) = -2, \quad \lim_{x\to 0^+} g(x) = 2, \quad g(2) \text{ is undefined,}$$
$$g(3) = 5, \quad \lim_{x\to 3^-} g(x) = 3, \quad \lim_{x\to 3^+} g(x) = 1,$$
$$\lim_{x\to 5} g(x) = -2, \quad g(5) = 2, \quad \lim_{x\to 6^-} g(x) = -1.$$

3. [6 points] Evaluate the difference quotient $\dfrac{f(2+h)-f(2)}{h}$ for the function $f(x)=x^3$.

bonus problem [5 points extra] How big do you think the limit

$$\lim_{x \to 2} \frac{x^2 - 2x}{x^2 - x - 2}$$

is?