

Quiz 1 Solutions and Comments

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October 9, 2006



NARF! This is fun, as I am providing you all with solutions to the quiz. I watched Corey grade each one of them, and am satisfied that he graded them all correctly! Although, even Corey makes mistakes, and if you think he's misgraded your work, be sure to see him privately. I should say that as a whole the class did great! I do have some comments for everyone, though, that I'll intersperse around my solutions. Corey asked me to tell you that if you see a "See solns" on your paper, that he's asking you to see this document – see, he knew that I'd be commenting on common mistakes and knows that for many people making the same mistakes can see this document, and that's easier than writing the same thing on a lot of quizzes! See the chart below for the grade breakdown. Oh, and ROCK ON!

Grade breakdown, remember everything is out of 50 points:

Score	Number of people scoring that
45 – $-\infty$	21
40 – 44	3
35 – 39	0
30 – 34	4
$-\infty$ – 29	3

1. Everyone did pretty well on this one: (a) 1, (b) 1.9, (c) 1.99. I would say these numbers are approaching (d) 2.

2. See below for what I would write for the solution to this problem. It's common that when I grade Calculus papers that have to do with this sort of problem that I see a lot of jumbled inequalities and some stuff that doesn't make any sense. Remember that this problem asks for a careful argument that the limit is what it is. So for those that missed points, take a look at the next paragraph and hopefully you'll see more about how it goes. But be sure to ask Corey in his office hours if you're still not sure.

Let $\epsilon > 0$ be given. I must find a δ so that $|(5x+1)-31| < \epsilon$ whenever $0 < |x-6| < \delta$. Since $|(5x+1)-31| = |5x-30| = 5|x-6|$, we can choose $\delta = \epsilon/5$. Then $5|x-6| < 5\delta = \epsilon$.

3. For this problem, remember that *limits don't have anything at all to do with the actual output of the function at the point you're interested in*. My friend, The Brain, mutters that all the time as he walks around the lab, before bopping me on the head and telling me that we're going to take over the world. Most everyone who missed points on this one missed them because they wrote down the output of the function, rather than the limit (should it exist at all). All the same, the answers are (a) 2, (b) DNE, (c) 0, (d) DNE.

4. (a) $\lim_{x \rightarrow 2} \frac{x^2-4}{x-2} = \lim_{x \rightarrow 2} \frac{(x+2)(x-2)}{x-2} = \lim_{x \rightarrow 2} x+2 = 4.$

- (b) For this problem, Corey seems to have made a mistake. He *MEANT* to ask

$$\lim_{x \rightarrow 1} \sin(x^2 - 1 + \pi) = \sin\left(\lim_{x \rightarrow 1} x^2 - 1 + \pi\right) = \sin \pi = 0.$$

Of course, what he actually typed out was $\lim_{x \rightarrow 1} f(x) = \sin(x^2 - 1 + \pi)$. I think the problem was that he didn't consult me before printing the quiz up. When I saw the quiz earlier today and pointed out the error, Corey was livid. I had to set him up playing some violent video games just to calm him down. That's why I'm writing this, and he isn't. Of course, I wouldn't trust him to get the right answers anyway. Corey told me he'd give full credit to everyone for this problem. So, on all of the papers is an OK. A lot of people could figure out what Corey meant to ask, but everyone got full credit for it.

So, there you have it. Back to the lab. One more thing, Corey told me not to forget to tell you:

ROCK ON!!!!