MATH 1743: Common Mistakes on Exam #2

Problem 1: The most common error on this problem was mistaking the data as being quadratic. While a quadratic model certainly wouldn’t be a terrible fit, it isn’t the best fit for a couple of reasons: (1) The data on the far right of the graph is starting to level off to increase again, which means that there is an inflection point (ruling out the quadratic model). (2) The context also suggests that the graph will start to increase to the right, just as the graph suggests: the more mobile homes that are sold, the more profit the company will make (this rules out the quadratic model as well). The most common mistake on parts (c) and (d) was not noticing that the instructions say to use the data, instead of the model, to compute the average rate of change and percent change.

Problem 2: Not many problems with this one; the most common mistake was using the APY formula for n-compoundings per year instead of the formula for continuous compounding.

Problem 3: Most people got the table part correct; among the common mistakes were: calculator errors, not labeling the second column of the table and rounding incorrectly (the directions say to round to the thousandths place for both the table and the answer). Part (b) merely consisted of writing the answer in calculus notation, i.e. $C'(35) = -2.259$ (from Form B). Part (c) required using the 4 parts of interpreting a change answer: When, What, How, By How Much.

Problem 4: On part (a), most people had the correct idea, but there were several times when the limit notation was messed up. The correct limit definition of the derivative is

$$f'(x) = \lim_{h \to 0} \frac{f(x + h) - f(x)}{h}$$

Additionally, just about everyone got the correct answer to part (b), but there were several problems with notation and writing it out. The correct form as discussed in class can be found in the quiz solutions (see http://math.ou.edu/~jcook/1743/1743quiz4-8sols.PDF), the practice exam solutions (library e-reserves), or the exam solutions (to be posted on the website soon). On part (c), many forgot to write the slope of the tangent line. Additionally, the slope was graded very loosely, but to get it correct, the given answer had to be negative (since the graph is decreasing at that point, the slope of the tangent line will be negative as well).

Problem 5: Everyone did quite well on the matching derivative graphs portion.

Problem 6: For finding the limit numerically, the common mistakes were the same as those in (3a); also, many wrote the table and seemed to have found the correct answer in the table, only to not write it down! There was also some confusion as to how infinite limits work: a limit only equals infinity or negative infinity if the y-values in the table are increasing or decreasing without bound. If they are approaching a specific value, that specific value is the limit. For part (c), the most common problem was forgetting to write the complete rate of change model (i.e. forgetting the units). For part (d), there seemed to be some confusion as to what $\frac{dW}{dx}$ when $x = 33$ (from Form B) means; it simply means to plug the given $x$ value into the derivative, i.e. find $C'(33)$. Again, interpreting the answer using the 4 parts of interpreting a change answer (When, What, How, By How Much) were needed for full credit.

Problem 7: There were no major problems with this question.