Math 111 Fall 2015 Exam 1 Commentary

The solutions to exam 1 are posted on the course website. In addition, I created this commenary sheet with information about each page of the exam, how it was graded, and where you should have encountered it in your studying. I hope this helps you review your studying and gives you ideas to adapt for exam 2.

Suggestions for Going Over This Exam:

1. Spend a couple minutes looking through the exam and seeing if you understand your mistakes. Even if you understand all your mistakes or did very well on the exam, still do the following steps (these are good things to do so that you can be even better on midterm 2).

2. Open up the solutions on the course website and look through them. Also read through this commentary.

3. Scan through the old homework quickly to see which homework problems were like the exam problems.

4. Scan through the old exams archive to see which exam problems were like the old exam problems.

5. Think about what you studied when you were preparing for the exam (did you look at the homework and exam problems that were like the question on the exam during your studying?).

6. Get out a piece of paper and answer the following questions:

   - What suprised you about this exam? Or what did you find most difficult?
   - How might you alter your exam preparation for exam 2 in order to improve?
   - Any other comments you want to make to yourself concerning exams in this class?

A few general comments about grading and my philosophy on grading:

1. Our job is to assess your ability to show your understanding on the test. If you didn't get the answer correct or if you didn't show understanding, then you will lose points.

2. We often give partial credit for showing some understanding even if the final answer is wrong. However, we do not guarantee you will get partial credit for everything you write down. For example, just copying a formula from a notesheet does not necessarily get you any credit. And we reserve the right to take off full points in certain situations, even if there is some correct partial work.

3. A significant/dramatic error in understanding is worth a large deduction (if you show something that clearly indicates you don't understand, then you get a big deduction even if some partial work may be correct).

4. We are more likely to take off bigger amounts of points on problems that are 'key concepts' or problems that are identical to homework (you don't get partial credit for only sort of knowing something that was key to the class or identical to homework).

5. If it is clear that the method you show is completely wrong, but you coincidentally get an answer near the correct answer you do NOT get any points (you don't get points for pure luck).

PAGE 1 OF EXAM: Given a distance graph. Most students did well on this page.

- Part (a): Reference line and diagonal intersection question! Like many old exams and homework.

- Part (b): Draw a secant, find the slope, and a very straight-forward translation. Also identical to many old exams and homework.

- Part (c): A translation problem. From 'a' to 'b' the change in height was 26. Depending on your version you were given either 'a' or 'b' and asked to find the other value. If you knew how to translate this should have been fast (I gave easy to read points).

- Part (d): Reference line and slide to tangent!

PAGE 2 OF EXAM: Given a TC graph. The TRUE/FALSE are worth 2 points each.

- Part (a): Find MC (the slope of a tangent line at the given quantity). **I very strongly hinted this would be on our exam**. If you did not draw a tangent and start finding a slope, then you got -3 on this problem.

- Part (b): You needed to know that $AVC = \frac{VC}{q}$. And you need to see that $FC = 30$ and that $TC = FC + VC$. I picked nice values so you could easily read TC. (You got -2 if you computed AC instead of AVC).

- Part (c): **Given market price, draw TR with that slope then find the largest vertical gap between TR and TC**. We discuss this at length many times in class and this appears on every old midterm in the exam archive. If you did not clearly draw TR and find the largest vertical gap where TR is above TC, then there was a big deduction (-2 or -3 depending on the severity of the mistake).

- Part (d)(i): $AC(q)$ is the slope of the diagonal line to $TC(q)$ from 0 to q. Get out your ruler and consider the diagonal line from the original to $TC(0)$, then from the origin to $TC(2)$, then from the original to $TC(4)$, ... You will notice that the slopes are getting smaller (so $AC(q)$ is decreasing).

- Part (d)(ii): $MC(q)$ is the slope of the tangent line to $TC(q)$. Get out your ruler and consider the tangent line at 40, then 42, then 44, then 46, ... You will notice that the slopes are getting higher (so $MC(q)$ is increasing).

- Part (d)(iii): **If the price is above BEP, then it is possible to make a positive profit**. If you gave a positive answer in part (c), then you should have already known that the price of 4.50 was above BEP!!!

PAGE 3 OF EXAM: Incremental or Rate information is given on this page and you have to appropriately interpret. The TRUE/FALSE are worth 2 points each.

- Problem 3(a): This is identical to a Supplement 8-9 homework question. You need to read off the value and remember that $TC(q) = qAC(q)$ and $VC(q) = qAVC(q)$.

- Problem 3(b): **If your explanation did not mention Shutdown Price or gave incorrect reasoning, then you lost 3 points on this part**. Remember the key concepts:

  If market price is above BEP, then positive profit is possible. If market price is below BEP, then positive profit is not possible.
  If market price is above SDP, then it is possible to recover some fixed costs (STAY OPEN). If market price is below SDP, then it is not possible to recover any fixed costs (CLOSE).

  Even though this was a key point of emphasis, some students will want to come to me and say that since profit is negative, you should close. If you say this to me, then you missed one of the key points we made in class. But let me briefly explain again with a short example: If fixed costs is $500,000, then you will lose $500,000 if you close this month (in other words your profit will be -$500,000$ if you close)! If I told you that staying open this month would mean that you end up with a profit of -$10,000 (and, in doing so, recover $490,000 in fixed cost), instead of -$500,000 would you stay open?

- Problem 3(c): This was identical to a homework problem (see Supplement 8-9 last problem). You had to find when $MR > MC$. Since this was word-for-word identical to a homework problem we were not lenient on partial credit. You had to get BOTH endpoint correct to get points. It was an all or nothing problem.

- Problem 4(a): Each TRUE/FALSE was worth 2 points. We discussed this at length in lecture and during review.
  The dot at $q = 4$ says that from 4 to 5, the profit goes UP $6. Profit is higher at $q = 5$.
  The dot at $q = 6$ says that from 6 to 7, the profit goes DOWN $3. Profit is higher at $q = 6$.
  This was just like homework and review, this problem should not have been a surprise.

- Problem 4(b): If you made any mistake here, you lost 2 points. You had to read carefully (I suggested an organized way to do these problems with tables in class, if you did this, then it should have been easy to be careful).

PAGE 4 OF EXAM: Line and algebra questions (I told you this would be on the last page).

- PART (a): This was identical to homework. This should have been quick (let $y = 0$ and find x, then let $x = 0$ and find y).

- PART (b): I very strongly hinted in class that you would have to find the equation of a line on this test. Several people didn't subtract their x's and y's in the correct order when they did their slope (in class I have been suggesting a way to check your work and be orginaized with finding slopes, if you missed that come ask me about it).

- PART (c): Most students generally knew what to do, but there were quite a few algebra mistakes (not distributing correctly). There also were many unit mistakes. If $x > 6.89655$ and x is in thousands, then the nearest item is at 0.001. So you have to round to $x > 6.897$!!! If you are using the variable x, you had to write it this way. Many students lost a point here.