How to write up solutions to homeworks and exams in Math 120

Math 120 is a problem solving course, which means that you do not have to know or provide rigorous proofs. You do have to justify your answer: explain your approach, name theorems that you're using, show your work (including all relevant calculations), and give all necessary reasons for your conclusion. You do not have to write essays, just enough that we can follow what you have done. Points will be deducted if your work is incomplete, even if your answer is correct. We will also give partial credit for correct work shown, even if you make some errors and get the wrong answer.

The next page has a few examples with notes about what needs to be written down for full credit. First some general notes:

1. Box up your answer, and cross out any work that you do not wish to be counted. If we see a page with two different answers, and there is no indication as to which solution you want counted, then we will only give you points for ideas that are common to both.

2. Make sure your solution is legible. We try very hard to decipher everything, but if your work is too messy to be read, then we will not be able to give you credit for it. If you run out of space on a test, you may continue your work on scratch paper – just make a note of this in the exam, so that the grader knows to look elsewhere.

3. One extra note for homeworks: leave enough space for the grader to provide comments. And please staple the problem set. Folding the corners together does not work once the homework is actually opened, which leads to (a) unhappy grader and (b) possible loss of points if your loose pages fall out.

Examples of what you need to write (legibly) in order to get full credit:

1. A limit problem

(a) If you are proving that the limit doesn't exist, clearly label "Path 1, y = x" (or whatever it is), show the calculation, and box up what value you get from it. Same for "Path 2, y = 0" (or whichever one gave you a different value). Then write your conclusion ("different values along the paths, so limit DNE"). Similarly for any other approach.

(b) If you are proving that the limit exists, indicate what technique you're using at each point (eg. "squeeze theorem", "converting to polar", "L'Hopitals rule", ...), write out all corresponding calculations, and box up your answer for the limit.

2. A max/min problem on a region

Provide a commentary: "checking for CPs inside", "checking boundary y=x", "checking boundary y=x^2" (or whatever they are), "listing endpoints", "comparing all values", and box up the answer. We need to see where each part is, and where the points you list at the end came from. If any points are missing from the final list, or if any points make it onto the list without an explanation, you will lose credit.

In each part, write out all corresponding calculations, and clearly indicate the points they give you. Include solutions that already came up in another part, or else we may think that you didn't solve the equations correctly.

3. A line integral of a field.

(a) If you're doing it by hand, make sure to write down the formula you're using. Write out the parametrization for your curve, and all relevant calculations (computing r', F*r' etc.), write out the final integral and its solution.

(b) If you find that the field is conservative, make a note of that (giving your reason), followed by (presumably) "using FTLI". Next part depends on your solution:

(b1) If from there you decide to look for the potential function, label it clearly, and include any calculations that led you to it. Write out the formula that integral of F*dr = f(end point) – f(start point), (computing the points, if they don't come explicitly with the statement) and box up the final answer.

(b2) If instead you decide to go for path independence, say so. Describe the new curve you wish to use, and proceed to compute by hand along that curve (following the directions above for (a)).