These thoughts are offered in partial response to some of the recent anonymous feedback I’ve received, as well some of the discussions I’ve had with some of you throughout the quarter. Nothing here is gospel; I offer only my own observations and impressions formed over a span of thirty-five years as a math student and fifteen as a math professor. I hope these ideas will mingle with your own and at least give pause for further thought. Thank you all for your input, and keep it coming.

**Book Problems vs. Weekly Homework**

Much of the feedback has surrounded the difficulty of the weekly homework. The following themes in particular have emerged:

1. Comparability to in-class discussion
2. Value versus suggested book problems
3. Sheer difficulty (especially if working independently)

I completely agree that the weekly homework is by and large far beyond what we discuss in class. This is by design and I’d like to give you some insight into the thought process behind the decision. Feel free to disagree, but I do think it makes a difference that you know how much thought goes into the design of the course; nothing is arbitrary.

As I see it, class is meant to be a well thought out introduction to a new idea. Nothing more. In fact, experience suggests to me that it could not be otherwise. After all, here are mathematical ideas centuries, sometimes millennia, in the making and we meet in class for two hundred minutes each week. Our time together in class is the blink of an eye.

Thus class time is but a taste of what’s to come, an opportunity to ask elementary questions, and a chance to imagine greater possibilities. To seize on these initial opportunities, though, we must go beyond the borders of our classroom and consider introductory ideas in greater detail. The first step on the path to further discovery is the suggested book work.

In the carefully selected book problems we find the opportunity to practice calculations, synthesize aspects of our in-class discussions, and, on occasion, run into obstacles that stretch our understanding or even bring about questions we didn’t even know we had. To summarize, the key point of book work

...
is to monitor our own progress by highlighting any gaps or misconceptions we may have coming from the in-class introductions.

I have held calculus classes in the past where the homework was suggested book problems collected twice a week, usually on Tuesdays and Fridays. One positive result of this set-up is that we must not fall behind on book work because it is due so frequently. One downside, though, is that an emphasis on mechanical book problems can suggest that that’s all there is to it: mechanics. I cannot tell you how often I have heard “I could do all the book problems, but then the test seemed to be on a whole different plane.”

The point, then, of the difficult weekly homework problems is not to assess whether we have understood the book work. Rather, the weekly homework is designed to bring the limitations of the rote techniques into bright relief. We are not meant to demonstrate our mathematical might on the weekly homework, we are meant to face our mathematical demons and weaknesses. We are not meant to seek reward for coming to class and doing book work, we are meant to struggle and build mathematical character and resilience. We are meant to walk in the darkness, for that is where the great problems lurk.

Now, all of that is big talk and can be very, very discouraging if the resources to emerge from the darkness are lacking. Let me be clear: we are not meant to sit down and do the weekly homework perfectly on our own. It may well be that after heartily considering a weekly homework problem you feel no nearer its solution than when you began. But you are.

Every minute spent in the darkness can and should be a minute well spent. What attempts failed? Why? Do you not comprehend what is being asked? Why not? What tools in our bag make most sense in the given context? Do you feel information is lacking? What data would help you move forward? What is the difference between this problem and the book problems you can do more easily? Do you need to use calculus or other mathematical techniques from your past? Which ones? Can you, or are you so rusty that the tools are failing you?

If an hour’s worth of effort yields ten questions and no answers, congratulations: you are studying mathematics deeply! Work with each other, ask your professor, join a study group; we are all in this together. The days of sitting down and doing your math (or physics, or statics, or dynamics, or chem) homework in solitude are over. O-V-E-R. This is not how problems in the real world are solved and it’s not how they are solved at Cal Poly.

If you cannot make progress on a problem without help or discussion with
others, it doesn’t mean you are lost. It doesn’t mean the work is unreasonable. It doesn’t mean you have been shortchanged in class. It doesn’t mean you are out of your league. It means you are working on the right kinds of problems and squeezing every last ounce out of your opportunity here.

Summarizing,

1. Yes, book problems are sometimes harder than our in-class discussion, and weekly homework is almost always much harder. This is on purpose.

2. The book and weekly problems serve different purposes. To compare their value is to compare apples and oranges.

3. Yes, the weekly homework is often beastly. Yes, your friends’ in Calculus III probably have it easier than you. But are they better off?

**Practical Matters**

Don’t forget that I’m the guy who flunked algebra in eighth grade and then tried to forge his report card. I know that life does not revolve around math class. I know that practical concerns temper the rhetoric of the previous section.

There are matters of money, parental expectations, self-imposed expectations, grades, internships, graduation, a good job, financial freedom, family security, a healthy 401K and a super nice mahogany casket to top it all off eighty years from this moment. I get it, I’m future you.

So let’s talk about the rest of the quarter in our class.

1. **Final Exam** As promised, the final exam score will replace your midterm score if it is higher. Additionally, the final exam will consist of two “tiers”: Tier I will be based on minimal competency (problems will come from the book, though not necessarily the ones suggested on the daily homework); Tier II will require deeper and broader understanding.

Anyone scoring at least 90% of the points possible on Tier I will pass the class, no matter the performance on the rest of the final or the overall course percentage. If you demonstrate competency on Tier I, you pass. Period.
2. **Homework** If you maintain that the weekly homework is not working for you, let me offer an alternative. For the remaining two assignments (the current HW 6 due 11/22 and the upcoming HW 7 due the last day of class), you may turn in the weekly homework as usual OR turn in all the suggested book problems from the previous FMTTh.

For instance, if you choose the second option to turn in on 11/22, you will turn in the book work from 11/15, 11/18, 11/19 and 11/21. Whatever you choose, turn in polished write-ups and treat your assignments as you would final drafts of essays in English class.

3. **Office Hours** In addition to the usual office hours throughout the week, there will be two Math 143 exclusive office hours to prepare for the final. The first will be on Wednesday, 12/4, 1-4pm, and the second will be on Tuesday, 12/10, noon-3pm (the day before your final exam). I’ll remind you as the dates approach and let you know about the locations then.

These will only be effective if you come with “everything I always wanted to know but never got around to asking” types of questions. Also, waiting for the one right before the final is ill-advised.

**Conclusion**

The mathematical credentials of this class are as good as any fall Math 143 I’ve had, and I’m no rookie professor. You are capable of greatness, but it will (and should) require monumental effort. I am right here to do all I can to help you reach your potential. In the immortal words of Prefontaine, “To give anything less than your best is to waste the gift.”

Don’t waste the gift.