You are a first-year graduate student in mathematics at "LSU" (Large State University), and you're a few weeks into your job as a TA for two sections of calculus. At LSU, calculus is taught by a professor in a large lecture hall (with hundreds of students) on Mondays, Wednesdays, and Fridays, and then you and the other TA's meet with about 25 or 30 students in discussion sections held on Tuesdays and Thursdays to go over homework and to answer questions.

You get along well with your fellow TA's, but you notice that some of them are not as dedicated as you are to teaching their discussion sections. One fellow (let's call him "Andy") seems particularly bad at teaching; he doesn't prepare for class, he jokes about how he doesn't care about teaching, he doesn't hold many office hours, and the one time you actually saw Andy teach (as you were walking past his classroom), you noticed that he kept making mistakes while going over a homework problem and he eventually just waved his hands and told the students to figure it out on their own.

You decide to mention this to the professor in charge of the lecture. It turns out that the professor isn't very dedicated to teaching either, and she tells you not to bother her about it.

Eventually, word gets out that you're a pretty good teacher, and some of Andy's students start showing up to your office hours and asking you if they can come to your sections instead of to Andy's. You're flattered, but what should you do?

(1) Try talking to Andy about how his students are having trouble in his class.

(2) Have a discussion with the Graduate Advisor (a professor in charge of the graduate students).

(3) Tell the students that they can always drop Andy's section and sign up for your section.

(4) Let students just show up to your section if they want.

(5) Other?

You're in your fourth year of graduate school, and you're now an instructor for a small pre-calculus class (this means that you design the course, choose the textbook, give the lectures, assign the grades, and so on). Over the summer, various textbook publishing companies start to send you free "review copies" of their pre-calculus books, in the hopes that you will choose their book for your class. You didn't ask for these books, but the publishers must have found your name on the department web site as the instructor-in-charge. The books are clearly marked "Review copy, not for sale" and "Resale prohibited" and "Help keep textbook costs down by not selling this book". Furthermore, some of the books also contain instructor-only answer keys and sample exams and other add-ons that are meant only for instructors and not for students. You decide to use the same textbook as last year for your class, and so you put away all those other books and forget about them.

One day, a book purchaser shows up at your office door, and ask you if you have any textbooks to sell. He notices the large stack of pre-calculus books sitting on a shelf, and he says that he can give you $250 cash for all of them. He pulls out a large wad of bills and offers it to you. What should you do?

(1) Refuse to sell; the books clearly say "not for sale". (Next year, when you're finished your dissertation and are moving out to your new job, you throw away the now outdated pre-calculus books in the dumpster and think about how much pizza you could have had with that $250).

(2) Sell the books, but put the cash in the grad student coffee jar and enjoy the higher-quality coffee for the next few months.

(3) Sell the books and pocket the cash; the first-use doctrine makes it clear that your actions are not illegal.

(4) Spend a few hours boxing up the books and sending them all back to the publishers.

(5) Other?

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†Inspired by Chad Westphal's case studies from Wabash College's 2010 Summer Institute in Mathematics.

Once again, you're an instructor for a small pre-calculus class at Large State University. A couple of students have been struggling all semester. They have both been working hard and coming in to office hours on a frequent basis, but they both have some significant gaps in their math background and so the class is pretty hard for them. Unfortunately, their scores on the final exam are a bit too low, and so both students end up with a 58 in the class, and so you realize that both of them will fail.

Just before you're about to submit the grades, you get a knock on the office door. It's one of the failing students, and he asks about his grade. You tell him that he won't be passing the course, and he begs you to reconsider. He tells you that he's a first-generation college student on scholarship, and if he fails this class then he will lose his scholarship and be forced to drop out of school. This is his one chance to get a college degree, and he pleads with you not to give him an F.

To stall for time, you tell him that you need to talk to your adviser, and you go see her in her office down the hall. She listens to your story, smiles, and tells you that forty years ago, when she was a young graduate student, she had the same request from a young man, except that back then, flunking out of school meant that the student's academic draft deferral would have expired and so he would have been sent over to serve in Vietnam. Your adviser goes on to say that she and her fellow instructors all agreed to keep such students from failing, and so many draft-age young men got D's that year instead of the F's they deserved. But (she went on to say) times now are different, and so you'll have to decide for yourself what to do.

Again, you're even more confused. What should you do?

(1) You keep the grades as they were: both students fail. It's not your fault that the student will flunk out of school and lose their scholarship.

(2) You decide to grade on a curve: 58 is now a D-, and likewise 68 is a C- and 78 is a B-. The entire class gets slightly higher grades, and your two students pass.

(3) You pass the one student for humanitarian reasons, and hope that the other student doesn't find out.

(4) You give the student another, completely new, final exam and tell him that if he passes this new final then you'll pass him for the class.

(5) Other?

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‡Inspired by Chad Westphal's case studies from Wabash College's 2010 Summer Institute in Mathematics.

Your work in graduate school covers number theory, combinatorics, and coding theory, and it has nice applications towards creating better algorithms for transmitting data with error-correcting codes (these are currently used in CD and DVD players, for example). One day, you get a call from someone at the NSA who asks you to come up to their campus at Fort Meade, Maryland, to give a talk to their staff about your research. It's an all-expense paid trip for the weekend, plus a $500 honorarium, and it would be a nice addition to your resumé. On the other hand, you have some concerns about the kind of work that the NSA and other intelligence agencies do; in particular, you're worried that your research might end up being used to create better algorithms for illegal spying on Americans.

You talk about this to your officemate, who points out that the NSA is actually the world's largest employer of PhD mathematicians and also funds special programs for women and minorities to pay their way through graduate school. She goes on to say that she's heard that the NSA is a great place to work, and that if the NSA is inviting you to give a talk, then they might next invite you for a job interview, and in the current economy that's a pretty big deal.

So now you're even more confused. What should you do?

(1) Politely refuse the invitation; you don't want your work to possibly be associated with the violation of civil rights.

(2) Give a watered-down version of your talk that only gives vague generalities, and hope that nobody asks any questions.

(3) Give the full version of your talk; after all, your research is going to be in the public domain as soon as you publish your dissertation, so the NSA will eventually know about it one way or another.

(4) Other?

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§Inspired by Chad Westphal's case studies from Wabash College's 2010 Summer Institute in Mathematics.

You're a graduate student at Large State University, taking the standard first-year graduate course in analysis. Like 75% of the other graduate schools across the country, your school uses the classic book *Real & Complex Analysis* by Walter Rudin. Your professor stated at the beginning of the course that everyone is welcome to work together on the homework assignments, and so you get together with some friends each week to work through the problems together. You're not worried about getting good grades on your homework, because in math graduate school everyone who shows up gets an A. The only things that really count in graduate school are passing your qualifying exams by the end of your second year, and writing up a dissertation that is both true and original. Nobody's too worried about homework in a first-year class. Still, you and your friends want to do well because if you can master this material then you'll be able to pass the qualifying exam in analysis next year, and hopefully catch the attention of one of the professors to be your adviser, so everyone's working hard on the homework problems.

One of your friends in your study group (let's call her Beth) is turning in brilliant answers that catch the attention of the grader, who shows them to the professor. The professor is so impressed that he's mentioning them in class and even handing out copies. But then you find out your friend Beth is getting the answers from a web site belonging to some other grad student (on the other side of the country) who wrote up and posted their own answers to the exercises in Rudin's book. [This actually happens; a Google search for `"real and complex analysis" rudin solutions` turns up complete solutions by someone at MIT appearing on the "Chinese Google" `baidu.com`, and another set by someone at the University of Utah, and an incomplete set on `scribd.com`, and another set from the University of Kentucky, and so on.] This isn't a question about plagarism (at your graduate school, there's no pledging of homework) and besides the homework grades are irrelevant. But you're concerned that Beth is getting all this attention and praise for something that's not actually hers. And you had thought about asking your professor to be your thesis adviser, but now it looks like he might instead work with Beth (thanks to these supposedly brilliant solutions of hers). What should you do?

(1) Do nothing. If Beth continues to use other people's work, it'll eventually come out when she is unable to pass her qualifying exams.

(2) Talk to Beth and tell her that you know what she's doing.

(3) Talk to the professor and ask him if it's OK to use homework solutions found on the web; if he says no, then mention casually that you had heard that some of your fellow students had already been doing that.

(4) Go check out those websites; why should Beth be the only one to get this advantage?

¶Inspired by Chad Westphal's case studies from Wabash College's 2010 Summer Institute in Mathematics.

You're writing your dissertation, and it involves doing some very tricky mathematical calculations. You're at an impasse, and so your adviser recommends that you "search the literature" to see if anyone else has dealt with these calculations. These days, a search of the literature also involves a search of the web, and you find a perfect example on a Bulgarian website belonging to someone who was working on the same problem (Thank goodness for Google Translate!). The algorithm is just what you need, and you are able to apply it to your own work and finish the calculations. The website even has some beautifully intricate graphics related to the calculations that really help to illustrate the technique, and so you borrow those, too.

You want to credit the author, but your email to the Bulgarian website bounces back to you with a "no recipient" error message, and you can't find anything else about the author via Google. You mention the problem to your officemate, who says that in such a situation it's always best to get permission from the other person before using their intellectual property.

You're a little worried about asking your adviser, because if it turns out that you shouldn't have used the algorithm without permission, then you wouldn't have been able to finish your calculations and perhaps even your dissertation. But you can't even find the Bulgarian to ask permission. What should you do?

(1) Include the pictures and use the algorithm. The information and pictures were on the web and hence can assumed to be in the public domain.

(2) Put a footnote in your dissertation giving credit to the Bulgarian author with a link to the website, and hope that nobody asks you if you asked for permission.

(3) Ask your adviser about what to do (and hope for the best).

(4) Other?

‖Inspired by Chad Westphal's case studies from Wabash College's 2010 Summer Institute in Mathematics.