Why do professors teach 1 + 1 and then ask you 19.8 * 76 in exams?

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Here's a common scenario that plays out in college math classes ALL THE TIME. It's a bit long-winded but I hope it paints a useful picture contrasting student perception and faculty perception.

Your professor taught you some theoretical idea in a 50 minute lecture that was new to you and is really quite complicated. She then had only 5 minutes left to do an example problem so she picked one that was relatively easy to ensure that everyone could follow the example, and it wouldn't be rushed (knowing that your book contains several other examples of varying difficulty). She then hoped that, as a college student, you would carefully read the text and work through the more challenging examples provided there in order to learn to apply the complicated idea on the kinds of problems appropriate for the level of the class. She hoped that you'd run into 25 brick walls while trying to master the material and that you'd be able to get over 15 to 20 of those walls your own. She hoped that you'd swing by office hours (where she sits alone for hours each week) and let her help you knock down the last few that remain so that when your exam came around, you'd deeply understand the theoretical idea and be able to apply it to any (reasonable) problem.

However, from your perspective, you just saw a 45 minute discussion of something that sort of made sense followed by an example that ***really*** made sense. Since you understood the simple example, you decided that you basically understood the entire lecture. Instead of heading back to your dorm to fight your way through the chapter in the book and work your way through all of the example problems until

you had mastered them, you played in an IM softball game, worked your shift to help pay for this expensive education, volunteered as a tutor at the local elementary school, checked your Facebook feed, wrote a really great paper for your history class, and then went to bed exhausted (so you could do it all again the next day).

A week later (maybe the night before it's due) you sit down with your friend to work on the homework problems for this material. Between the two of you, over the course of a few hours, mimicking the examples from the text, checking with the answers to the odds posted in the back of the book, and using whatever you can find on the internet, you manage to write (somewhat muddled) solutions to most all of the homework problems. (You might even assume the one or two really hard ones that you couldn't do are too tough to ever appear on an exam anyway.) Your professor (who doesn't really care about the homework because she just cares if you learn the material in time for the exam) quickly scans your solutions, gives you a 10/10 and draws a smiley face, and you are even more convinced that you have mastered the idea than you were when you followed that "1+1" example in class last week.

A few weeks after that, you sit down to take a test, on your own, with no help from anyone or anything. All you really understand from the lecture that day is the "1+1" example. You partially understand the theory and partially understand the homework solutions; however, your partial understanding is PAINFULLY exposed during math exams because that's the nature of math. You can't get by on partial. You get destroyed.

You walk away thinking that "1+1" is all you were taught, but you don't recognize that "1+1" is simply all you learned. You were supposed to master much more by working long hours on your own with the book, wrestling with difficult concepts, and coming to office hours to ask the inevitable questions that you couldn't resolve on your own. But you didn't. You had other classes, other priorities, and other obligations. You didn't love the subject enough to immerse yourself in it. Your professor understands. In fact, she's probably even sympathetic to the point that she gives you a C- when you really deserve an F (or a B+

when you really deserve a C).

Later, you find out that 3 students scored near 100% on the exam, and you assume they must be math geniuses and dismiss the possibility that you could ever duplicate the feat when the truth is (or might be) that you could do just as well if you were willing to spend 15 hours per week on the class rather than 4.