

Note that the course you'd expect to see each problem in is listed. Please avoid using anything beyond the scope of the listed course.

1. Find the equation of the line parallel to the line $2x + y = 1$ passing through the point $(-1, 5)$. Express your answer in slope-intercept form ($y = mx + b$). [From 3C]
2. Farmer John want to fence off a rectangular enclosure of largest possible area. 10 feet of fence has already been placed in a straight line. John has 28 feet of fence he can add to this to complete the project. What is the largest area he can enclose? [From 20A]
3. Let f be a function such that f'' is continuous, $f(1) = 2$, $f(2) = 5$, $f'(1) = 3$, and $f'(2) = 4$. Compute

$$\int_1^2 x f''(x) dx.$$

[From 20B]

4. Suppose $f : X \rightarrow Y$ and $g : Y \rightarrow Z$ are injections. Prove that $g \circ f : X \rightarrow Z$ is an injection. [From 109]
5. Let $\mathcal{P}_3 = \{a_3x^3 + a_2x^2 + a_1x + a_0 \mid a_i \in \mathbb{R}\}$ denote the set of polynomials of degree at most 3. Prove that \mathcal{P}_3 is a vector space. [From 18]

Types of students:

1. **The overwhelmed struggling student** You are struggling to understand the new material in this class and are down on yourself. You have no idea where to start on this problem, and you are discouraged and just want to give up. You are inclined to become upset and frustrated (though not belligerent). At any moment you feel like you might burst into tears.
2. **The over-confident student** You think you totally understand everything, but for some reason you keep getting the wrong answer or your proof won't come together. You've come to the TA, but you believe that you actually know more than he/she does. You're not inclined to take the TA's suggestions, and frequently make comments about how smart you are and how much you know.
3. **The eager but fundamentally confused student** You love this class, but you find yourself struggling more than you thought you would. You are desperate to understand and generally good-natured about your misunderstandings. But try as you might, you just don't seem to "get it". The TA can explain something over and over, and somehow it just sinks in very, very slowly. In this role, you should get the same question (or type of question) wrong in the same way over and over, but every so often you should get something right.
4. **The shy and quiet student** You actually have a pretty good idea about what's going on, and you "get it," but you are shy and don't have confidence in your abilities. You're pretty sure you know how to solve this problem (and with a little guidance you will be able to complete the problem correctly), but you lack the confidence to start on your own. You just need a little reassurance that you're on the right track and you'll be fine. You definitely do not need someone to treat you like you don't know what you are doing or to start over and explain everything from scratch.
5. **The student who just wants the answer** You aren't really very interested in this class. You're pretty confused and you don't feel like putting any mental energy into the assignment. You have come to your TA because you really just want them to tell you the answers. You are not leaving until you have a working solution to the problem. You are not rude to the TA, but just insistent about getting him or her to tell you the answer. However, you should not be so stubborn that you do not respond to the TA's attempts to engage you in learning, if you feel these attempts are successful.