**Tips for Doing Well in Precalculus**

This is not an easy course, for a number of reasons. There is a lot to memorize (depending on the unit we’re studying). You see problems that don’t look quite like the examples you’ve seen before. Some problems are quite long, requiring multiple steps before you get to an answer. On top of that, mistakes can pop up at a number of places, which is an issue especially when tests don’t give partial credit!

Here are some suggestions that may help. Check over this list periodically.

1. **Start attacking the material quickly.** If you don’t understand this material, go to office hours or a tutor, send email, or look over the book. Above all, do something EARLY. Topics and concepts build on each other, so you have to solidify material before proceeding to new topics.
   - *Spread out your work.* When you start assignments early, you get more chances to ask questions, and you develop more opportunities for deeper understanding.
   - *Keep in contact with your instructor.* Office hours are not just a place to go when you’re struggling. They are a place where you can bring up any type of question, including just checking to make sure you’re understanding things correctly. I especially recommend conceptual questions; it’s generally more productive if we make sure you understand what’s going on instead of just drilling problems. If you can’t make my usual hours, feel free to negotiate a side meeting or shoot me emails. The “Ask Your Teacher” buttons in WebAssign can also be useful! (Keep in mind, though, that I don’t generally stay up past 10pm or so for student emails.)

2. **Practice your algebra.** In WebAssign, since you don’t get partial credit, accurate computations are very important. Go over your work, asking questions like “What am I solving for? Which operation gets canceled next? How will this law help?”
   - *Equations can be read both ways.* Sometimes, you start with the left side and go to the right, and sometimes it’s the other way around. Usually, these processes are opposite! Be familiar with what each one is meant to do.
   - *If unsure, test out some simple numbers.* A lot of bad algebra can be caught quickly by testing out some numbers. For example, $\sqrt{a^2 + b^2} = a + b$ must be incorrect: if I try making $a = b = 2$, then the left side becomes $\sqrt{8}$ (which is less than 3) and the right becomes 4.
   - *Explain to yourself what algebra concepts mean informally.* For instance, $a^n$ is what you get by multiplying $n$ copies of $a$. Try to imagine a whole line of ‘$a$’ factors in a row when doing algebra with these objects!

3. **Go back over your notes.** You usually can’t learn something by looking at it just once. There’s a big difference between “this made sense when I saw the teacher do it” versus “I can do this without prompting”. It’s especially useful to look at the steps and ask yourself WHY they were done; how do they help?
• Ask yourself open-ended review questions. There’s a backstory to most material in this course. You’ll find it more interesting and clearer to understand if you try and prompt yourself in ways that get you to explore it! For instance, when you’re done with an exercise, ask yourself what happens if you change some of the given data. What if you change what TYPE of data you start with? In which ways can questions be altered without affecting the main skills used in the question? My favorite question types in studying are “Why...?” and “What if...?” (although “How...?” is also important, i.e. knowing how to actually do the skills we teach). These questions make math more relevant and more fun!

• Try to understand material from multiple perspectives! There are quite a number of ways in which material can be understood. One is repetition: can you state the result? Another is informally: do you have a picture in mind or some casual explanation for what this result means? Another is precision: can you meticulously treat the parts of the result correctly? Another is familiarity: How would you recognize the use of the result, and what is it good for?

4. Identify a goal, and break it into pieces. Look over questions for clues that signify what you want and which topics may be appropriate. Sometimes it’s very useful to think backwards from the goal: “to find my answer, what else would I like to find?” Very common questions to ask yourself include “What am I ACTUALLY looking for?” and “Which values in this formula are known?”

5. Rather than memorize problems, identify skills! This is where people get into trouble. You can fake your way through a lot of this by trying to memorize the HW problems you see (i.e. “the waterslide problem” or “the depreciation problems”). However, if that’s how you mainly study, then you miss out on the whole point of mathematics, which is being able to fit our tools to a whole variety of problems!

Put another way: it’s not about which problems you recognize; it’s about HOW you go about recognizing concepts.

Good luck!