

## Problem Sets in Theory and Practice

The primary purpose of problem sets is to enable students to learn the course material. In the physical sciences, the best way to learn is by doing problems. The reason problem sets are often a major part of the grading scheme is not to evaluate student mastery of the material (that's more appropriately done with exams), but rather to ensure that students actually do the work required to learn.

Learning the material goes beyond just learning how to do specific kinds of calculations, and includes the ability to use the material in creative ways. For this reason, good problem sets (and exams) often include applications of the course material to situations not specifically covered in this lectures.

In ASTR 160, we are concerned both with understanding the specific scientific issues, and with understanding in general terms how science is done, so the problem sets have a mixture of specific problems, and commentary on scientific issues. But the goal in both cases is the same – to ensure that students think about the material as deeply as possible. The purpose of the policies described below is to help make that happen.

**Lateness.** Problem sets are due in class on Thursdays. By "in class" I mean at the beginning of the class – I don't want you to skip class, or copy over your problem sets during lecture. So once I start talking, the problem set is late. If you submit the problem set after class, or to my office before 4pm Friday afternoon (if I'm not in, stick it under the door), we'll take only one point off (out of 20). If you hand it in at the start of your section on Monday, we'll take 2 points off. Problem sets will often be discussed in section, so after that we have to take off more points, since some of the thinking will have been done for you. So if you hand the problem set in after section, but at or before the end of class on Tuesday, you'll get half credit. We will post the answers on the website after class on Tuesday, so you get no credit after that. If you have a Dean's excuse that goes past the Tuesday deadline, we'll just skip the problem set altogether, and compute your problem set grade averaged over one fewer problem set – I'd rather have you focus your energy on the next problem set than simply copy stuff off the website.

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**Collaboration.** It is often very useful to talk about the problems with classmates, teachers or others, and you are encouraged to do so. On the other hand, it's very important to do your own thinking, and hand in your own work. Students often feel that these two statements are contradictory, and indeed they do introduce an awkward gray area in expectations. To clarify matters, we'll adopt the following policy: you can talk to whomever you like, but when you get to the point of writing down what you are going to hand in, you should be working alone, unprompted by any other person (including classmates, friends, TFs or tutors), or by anything another person has written. If you are working in a group (often a useful thing to do), please split up before you write down what you will hand in. We will check this by looking for identical phrasing (verbal or mathematical). We'll give a warning the first time we find something problematic, but after that we'll look carefully, and if we find further problems we'll take some form of Drastic Action. Depending on the severity of the situation, Drastic Action may include points off or reporting to the Executive Committee. But you'll suffer even if we don't catch you – if you don't make the effort to think these things through yourself, you won't do well on the exams.