

## PROBLEM-SOLVING STRATEGIES

- (1) Structure the problem. What is given? What is asked for?
- (2) Are you supposed to compute something? Write down clearly what it is. Then make a list of the ways you have used in the past to compute this. Is there something you could do to make the case you have more like something on the list?
- (3) Find a counterexample.
- (4) Find a similar example in the textbook, or in another textbook.
- (5) Make a sketch.
- (6) Do a computer simulation.
- (7) Work backwards from the answer you're trying to get.
- (8) If you're stuck on some point in the problem, try to give a good description of why you're stuck. Think of how the problem might be simplified. What is it about this point that makes the problem challenging?
- (9) Maybe you can't find an exact solution. Try to find an approximation.
- (10) Try some small cases. The problem may ask you to compute something for general  $n$ , or for some large  $n$ . Try  $n = 1, 2, 3$ . Look for a pattern.
- (11) Don't assume that there is only a single right answer, or just one way to get there.
- (12) If the question seems ambiguous, turn it into a question that seems clear to you, state that clearly, and solve it.
- (13) Try something. People often lack confidence, and think that they're stuck when they're not. They just don't see how what they've thought of can lead to a solution.

**What I will do to make homeworks less frustrating**

- (1) Have the TA write out solutions before I assign the problems. He sometimes notices points that are difficult which I don't.
- (2) Split the homework up into "routine" and "nonroutine" questions.
- (3) When  $n$  problems are assigned, your grade will depend on the  $n - 1$  best scores. You're free to leave off one question.
- (4) We now have a WebCT site. You can use the bulletin board to solicit help from other students.
- (5) I'm putting one or more copies of two books in Douglas Library: *Statistics* by Freedman, Pisani, Purves, and *Probability and Statistics* by DeGroot and Schervish. The first is extremely well written, and entirely non-mathematical: You may find it useful, as a different perspective on some of the ideas that we're covering. The second is fairly similar in scope and level to the Rice text, but some students say they find it more comprehensible. More alternative viewpoints are always useful.
- (6) As always, I'm available in my office during regular office hours, and by appointment.