IDS 101 Doing Mathematics

Today

1. Elements of problem solving
   (a) Polya's principles (understand the problem, devise a plan, carry out the plan, look back)
   (b) Expect failure. Repeatedly!
   (c) Try stuff anyway.
2. Report on yesterday's problems. Consider them with Polya's principles in mind.
3. Communicating with professors (see Google doc)
   (a) Your advisor (me!)
   (b) The Learning Center (first floor of Ford)
   (c) Tutoring (departmental or through TLC)
   (d) Your professor!
      i. **Go to office hours!** Don't worry about "looking dumb." [Tutoring protocol]
      ii. The library
4. Questions about anything?
5. Problems!

Problems

1. Leftovers
2. How many factors does a number have?
3. Ben is going to drive Erin, Nick, and Sarah home after a party at his house. The times it takes to travel between houses are as follows: from Ben's to Erin's: 3 minutes; from Ben's to Nick's: 5 minutes; from Ben's to Sarah's: 4 minutes; from Erin's to Nick's: 8 minutes; from Erin's to Sarah's: 7 minutes; from Nick's to Sarah's: 6 minutes. What route should Ben take to get home in the least amount of time?

4. You arrive home late and want to unlock your room without turning the light on and waking your roommate. You have 6 keys on a key ring, but you can't see them. How many different shapes of keys do you need in order to tell the keys apart by touch?

5. You have two pieces of string, each of which will burn for exactly one minute, but not uniformly along its length. How can you use them to measure 45 seconds?

Homework: Choose one problem you didn't finish today and take it as homework. Feel free to work with whomever you like, but be sure to list all collaborators in your write-up. Be prepared to tell us tomorrow about what you did to work on it.