Today: Church-Turing Thesis. § 3.3.
Next class: Catch-up (Turing Machine variants); review. § 3.2.
Reminders: Midterm Exam Friday. Reading. Newsgroup.

1. List the members of your group below. Underline your name.

2. [In the context of *Hilbert's tenth problem*.] Does the following polynomial have an *integral root*? Justify your answer.

$$7x^3yz^2 + 4xy^2 - x^3 - 55$$

3. Consider the description of the machine M near the middle of page 184 of the textbook. Provide Java or Python code that "goes through all possible settings of its variables to integral values" as mentioned there. Explain why your code is correct in this context.

4. Provide an informal but precise description of the algorithm for finding integral roots of a *univariate polynomial* of the form

$$p(x) \triangleq \sum_{i=0}^{n} x^i = a_n x^n + a_{n-1} x^{n-1} + ... + a_2 x^2 + a_1 x^1 + a_0 x^0$$

Why is it correct? What is its running time?

5. Provide a (1) *high-level description*, (2) *implementation description*, and (3) *formal description* of a *Turing Machine* that *recognizes* the *regular language* $(ab)^*$.

6. Depict the standard graph $K_{2,3}$ and, using the method of Example 3.23 of the textbook, list the encoding $\langle K_{2,3} \rangle$.