

## Homework 8 – Due Wednesday March 16

**You may talk to one another, you may consult any textbook, and you may talk to me.**

1. Read 5.3, 5.4, 5.5 of the Parker-Baldrige book, and for each section write down FIVE-to-TEN keywords or sentences, which taken together give a very short summary of the section.
2. Do the odd-number exercises from HW 21 on p. 121, from HW 22 on p. 124, and from HW 23 on p. 23.
3. We saw divisibility tests for 2,3,4,5,8,9,10,11. For 6 it is enough to check divisibility by both 2 and 3, but what about 7? Given a 4-digit number  $N$  in base 10 write it as  $1000d + 100c + 10b + a$ , so  $a$  is the digit representing the one's.
  - (a) Show that  $N = A10 + a$  for some whole number  $A$ . How many digits does  $A$  have?
  - (b) Consider  $N_1 = A - 2a$ . What can you say about  $N - 10N_1$ ?
  - (c) Can you devise an algorithm for checking divisibility by 7?
  - (d) Use your algorithm to check whether 1603 is divisible by 7.
4. Determine whether 7056 is a square, and whether 5832 is a cube. What is the smallest number that one needs to multiply 363 by in order to get a square?