

### HOMEWORK 3 (MATH 184, WINTER 2017)

**Read:** Bona, sections 3.1-5

**Solve:** Exc. 3, 4, 6, 7, 8 in §3.10, and the following problems:

**I.** Compute the ordinary g.f. for the following sequences:

$a_n$  = number of tilings of  $3 \times n$  rectangle with  $1 \times 2$  and  $1 \times 3$  bars.

$b_n$  = number of proper 3-colorings of a  $2 \times n$  grid (i.e. no two vertices of the same color can be connected by an edge).

$c_n$  = number of spanning trees in a  $2 \times n$  grid graph.

$d_n = F_1^2 + \dots + F_n^2$ , where  $F_n$  is the Fibonacci number.

$e_n = C_n + 2C_{n-1} + 2^2C_{n-2} + \dots + 2^nC_0$ , where  $C_n$  is the Catalan number.

**II.** Compute the explicit formulas for sequences in part I.

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This Homework is due Wednesday February 22, at 2:59:59 pm. (right before class). Please read the collaboration policy on the course web page. Make sure you write your name in the beginning and your collaborators' names at the end.

P.S. Each item above has the same weight.