

HOMEWORK 14
DISCRETE MATHEMATICS II
DUE 03-18 (NOT 03-20)

- (1) (a) Use the extended binomial theorem (Theorem 8.4.2 on p. 540) to write down the first few terms of the series for $\sqrt{1-4x}$ (up to x^4). You **must** use the extended binomial theorem.
- (b) In class, we showed that the generating function $A(x)$ for the Catalan numbers is given in closed form by one of the expressions

$$A(x) = \frac{1 \pm \sqrt{1-4x}}{2x}.$$

Use (a) to determine the correct sign. Justify your answer.

- (c) Use (b) to find the first few Catalan numbers a_0, a_1, a_2, a_3, a_4 .

- **Four** book problems: #8.4.36, 43, 49(a, c), 50(a-d).