

MATH 636, Fall 2013

HOMEWORK 6

To be prepared for presentation on Thursday, November 7.

Background reading: Combinatorics: A Guided Tour, Sections 3.3–3.5 along with the notes on products and compositions of generating functions.

If you wish to present one of these questions in class, claim it upon arrival. (If you have already presented, please let others present this time.)

See the next page for the option of turning in your homework for grading.

- 6-1.** Verify the following equation and use it to determine how many ways there are to score 100 points in basketball.

$$\frac{1}{(1-x)(1-x^2)(1-x^3)} = \frac{1}{3(1-x^3)} + \frac{1}{4(1-x^2)} + \frac{1}{4(1-x)^2} + \frac{1}{6(1-x)^3}$$

- 6-2.** Exercise 3.3.7 [*Hint: Multiply out some generating functions.*]

- 6-3.** Exercise 3.4.2

- 6-4.** Exercise 3.5.5

- 6-5.** Exercise 4.1.10 [*Hint: Use calculus!*]

- 5-5.** 3.5.1(c) and 3.5.1(d).

NEW: You may turn in a written up assignment for grading. This is not required. If you submit Homework 6, it will count toward your homework grade. If not, your homework grade will be calculated only as a function of the four written homeworks for this semester. (Homeworks #1, 3, 5, 7.) Here is the grading scheme, which I intend as less strenuous than for normal written homeworks.

- (✓+) A well-written homework solution that hits on all the main points. This corresponds to a grade of 110%.
- (✓) A well-written homework solution that contains most of the main ideas needed to solve the problem completely. This corresponds to a grade of 90%.
- (✓−) A homework solution that contains some of the main ideas but is not complete. This corresponds to a grade of 70%.
- (✗) A poorly-written solution that is a long way from a complete answer. This corresponds to a grade of 50%
- (0) No solution. This corresponds to a grade of 0%

I will average the scores from the best four of six solutions and this cumulative homework grade will count as one homework assignment to be averaged into your written homework assignments.