Due on Wednesday, January 30, at 5:00pm

Your assignment should be written neatly and stapled, and have your full name written in capital letters on the front page. Assignments that fail to satisfy these conditions may be disregarded.

Any statement should be supported by a proof or by a clear citation of a theorem/definition-proof in the textbook. All steps of a computation should be clearly indicated and justified.

Writeups must be individual. If you have received help with solving a problem, then briefly cite your source.¹

Hand in:
1.1: 2(b)(1pt; no partial credit), 4(2pts), 6(b)(1pt; no partial credit), 6(d)(1pt; no partial credit), 12(a)(2pts), 12(b)(2pts), 18(2pts), 20(2pts), 24(2pts)
1.1.1: 10(a)(1pt; no partial credit), 10(c)(1pt; no partial credit)
1.2: 6(1pt; no partial credit), 16(2pts), 18(2pts), 24(4pts)

Additional Problem. (4pts) Let $x, y \in \mathbb{R}$ and let $n$ be a positive integer. Prove that

$$(x^2 + y^2)^n = \left( \sum_{k \geq 0 \atop 2k \leq n} (-1)^k \binom{n}{2k} x^{n-2k} y^{2k} \right)^2 + \left( \sum_{k > 0 \atop 2k+1 \leq n} (-1)^k \binom{n}{2k+1} x^{n-(2k+1)} y^{2k+1} \right)^2.$$

Solve, but do not hand in:
1.1: 1, 3, 5, 7-11, 13-17, 19, 21-23
1.1.1: 1-9
1.2: 1-5, 7, 11-15, 17, 19-22, 23, 25-30, 32-34

It is your duty to make sure that you understand why points were taken off your homework and what the correct solution in each case is. You should therefore analyze your graded assignments carefully and ask questions (during office hours and/or whenever invited to do so during the lectures).

¹except for the case when the help was provided by the course instructor