Math 233 — Worksheet (Week 4)

Project 4

DEADLINE: 0900 MONDAY 20 MARCH

1 Reading

- Read chapters 4 and 5 and revise chapters 1, 2 and 3 of https://www.cims.nyu.edu/~regev/teaching/discrete_math_fall_2005/dmbook.pdf
- Note: you may be asked quiz questions on the reading without further warning. Read the reading *before* the lecture.

2 Project 4

Write out the proofs for the classwork in full. NO need to submit anything.

Classwork

1. Revise the quiz questions
2. Prove by induction:

   (a)
   $$1^2 - 2^2 + 3^2 + ... + (-1)^{n+1}n^2 = \frac{(-1)^{n+1}n(n+1)}{2}$$

   (b) For $n \geq 1$
   $$\frac{1.3.5...(2n-1)}{2.4.6...(2n)} \leq \frac{1}{\sqrt{n+1}}$$

   (c) For $n \geq 1$, $7^n - 1$ is divisible by 6