This problem set covers material from sections 1.1-1.3 of the book by Rosen. On your quiz, you may see some of the problems numbered 1-5. On your exams, you will be held responsible for any of the recommended problems as well (among other things).

Recommended Problems:
- 1.1: #3, 4, 6, 19.
- 1.2: #14, 32, 33.
- 1.3: #3, 22, 29.

Problems that could appear on the quiz:

1. Prove by induction the formulas
   
   \[(a) \quad \sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}.\]
   \[(b) \quad \sum_{i=1}^{n} i^3 = \frac{n^2(n+1)^2}{4}.\]

2. Find and prove a formula for the following expressions
   
   \[(a) \quad 1 + 3 + 5 + \cdots + 2n - 1.\]
   \[(b) \quad 1 + 4 + 7 + 10 + \cdots + 3n - 2.\]

3. Sec. 1.2: #10, 22.


5. Sec. 1.3, #6, 7.