

### Practice Exam 3

1. Twenty people attend a party. If everyone shakes everyone else's hand exactly once. How many handshakes took place at the party?
2. Prove that  $\binom{2n}{n} < 4^n$ .
3. Exercise removed due to several typos in the original write up which made it a harder problem.
4. 51 small insects are in a square of  $1 \times 1$ . Prove that at least three insects are inside a circle of radius  $1/7$ .

**The following are exercises I suggest from the Chapter 5 Self Test**

(Note: The solutions of the self-test are in the back of the book.)

5. 1
6. 2
7. 5
8. 8
9. 12
10. 16