MATH 114

Homework due Monday, November 22

4.5: 2, 4, 6, 8, 14, 22

7.1: 2, 4(ab), 6(d)

Also the following problems:

1. Nobody has more than 300,000 hairs on his head. A city has 300,001 inhabitants. Can you assert with certainty that there are two persons in this city with the same number of hairs on their heads?
2. From 52 positive integers, we can select two such that their sum or difference is divisible by 100. Is the assertion also valid for 51 positive integers?
3. Suppose that fifty-one small insects are placed inside a square of side 1. Show that at any moment there are at least three insects which can be covered by a single disk of radius 1/7.