

**Math 344 Winter 2002**

Problem Set 3

§7.6: 5, 9, 10, 11, 13, 15, 19, 22, 23, 24, 25, 26, 27, 28

Use 28 above to find  $D_i$  for  $1 = 1, \dots, 10$ .

§7.6: 29, 30

Show that  $m!S(n, m)$  is the number of onto functions from a set with  $n$  elements to a set with  $m$  elements.

§7.6: 35

- A. Suppose the squares of a  $100 \times 100$  checkerboard are randomly coloured red blue or white. Prove that there must be four squares of the same colour whose centers are the vertices of a rectangle. (Hint: select any four horizontal rows of squares then the four desired squares can be found in these four rows.)
- B. How many arrangements are there of the letters a,e,i,o,u,b,b,b,c,c,c,d,d,f with no adjacent pair of vowels? (First consider how to distribute the vowels and consonants.)

**Challenge problems (optional):** §7.6: 37, 38