EXERCISES IN STATISTICS

Series A, No. 1

1. The number of children recorded to each of 25 families were

$$2, 4, 1, 0, 1, 3, 0, 4, 2, 6, 0, 0, 2, 3, 1, 5, 4, 0, 3, 1, 2, 5, 3, 4, 1.$$

   (a) Construct a frequency table and a graph for the distribution of family size in this sample.

   (b) Find the sample mean and the standard deviation.

2. Find expressions in terms of the mean and variance of x for

   (a) the mean and variance of $y = ax$,

   (b) the mean and variance of $y = ax + b$.

3. The Centigrade temperatures of ten capital cities on Monday 6th October were

$$24, 27, 26, 16, 25, 28, 22, 15, 16, 26.$$

   The Fahrenheit equivalents of these are

$$75, 81, 79, 61, 77, 82, 72, 59, 61, 79.$$

   Find the mean and the variance of these temperatures in both Centigrade and Fahrenheit.

4. If the sample space is $S = A_1 \cup A_2$, and if $P(A_1) = 0.8$, $P(A_2) = 0.5$, what is $P(A_1 \cap A_2)$?

5. A man forgets his banker's card 10% of the time, he forgets his cheque book 5% of the time and he forgets both 2% of the time.

   (a) What is the probability that, on any one day, he will have both his banker's card and his cheque book?

   (b) What is the probability that he will find his banker's card in his pockets given that he has already found his cheque book?

6. A motor car is placed in the luxury class for the purposes of taxation if its engine has no fewer than six cylinders or a capacity of no less than 3 litres. 15% of all cars have no fewer than six cylinders, and 10% have no less than 3 litres. We know that 80% of all cars of 3 litres and more have at least six cylinders. What proportion of all cars fall in the luxury class?