Probability Tutorial Sheet A

1. A fair coin is tossed three times. Write out the sample space S.

   Write the sample points of the following events

   (i) the event that the first toss is heads

   (ii) the event that the second toss is heads

   (iii) exactly two heads in a row.

2. A couple has two children; the sample space is $S = \{bb, bg, gb, gg\}$ with probability 0.25 for each sample point. Find the probability p that both children are boys if it is known that:

   (i) at least one of the children is a boy;

   (ii) the older child is a boy

3. Compute the probability p of each event:

   (i) An even number appears in the toss of a fair die;

   (ii) One or more tails appear in the toss of three fair coins;

   (iii) A blue marble appears in a random drawing of one marble from a box containing four white, three blue, and five red marbles.

4. Suppose a student is selected at random from 100 students where 30 are taking mathematics, 20 are taking computer science, and 10 are taking mathematics and computer science. Find the probability p that the student is taking mathematics or computer science.

5. A lot contains 13 items of which 4 are defective. Three items are drawn at random from the lot one after the other. Find the probability p that all three are nondefective.

6. The probability that A hits a target is 1/3 and the probability that B hits a target is 1/5. They both fire at the target. Find the probability that:

   (i) A does not hit the target;

   (ii) both hit the target;

   (iii) one of them hits the target;

   (iv) neither hits the target.