Section 1: Working with probability

Exercise level 3 (Extension)

1. Over a long period of time I have worked out the probability that my train is late on a Friday is 0.1.
   (i) What is the probability that in my next 4 journeys at least one of the trains is late?
   (ii) What is the probability that in my next 10 journeys at least one of the trains is late?
   (iii) What assumption have you made in these calculations?

2. A washing-up bowl contains 6 spoons, 5 forks and 3 knives. Three of these items are removed at random, without replacement. Find the probability that
   (i) all three items are of different kinds.
   (ii) all three items are of the same kind.

3. A purse contains three 1p coins and seven 2p coins. Coins are removed at random one at a time, without replacement, until the total value of the coins is at least 3p. Then no more coins are removed.
   (i) Draw a tree diagram to show the possible outcomes.
   (ii) Find the probability that exactly two coins are removed.
   (iii) Find the probability that the total value of the coins removed is 4p.

4. Bag A contains 4 white and 4 black balls. Bag B contains 2 white and 3 black balls. A ball is taken at random from bag A and placed in bag B. A ball is now chosen at random from bag B. What is the probability that the ball taken from bag B is black?