

**COUNTING & PROBABILITY (Q 6, PAPER 2)**

**2006**

- 6 (a) Evaluate  $5\binom{8}{3} - 4\binom{8}{4}$ .
- (b) Niamh uses a password formed from one letter of her name followed by four of the digits from 1 to 9. She does not use any digit more than once.
- (i) How many such passwords can be formed?
  - (ii) How many of the passwords begin with N?
  - (iii) How many of the passwords end in an even digit?
  - (iv) How many of the passwords begin with N and use only odd digits?
- (c) Three coins are tossed. Each coin gives either a head or a tail.
- (i) Write down all the possible outcomes. For example, “H, T, H” or “head, tail, head” is one possible outcome.
  - (ii) Find the probability that the result is three tails.
  - (iii) Find the probability that the result includes no more than one head.
  - (iv) Find the probability that the result has at least one head.

**ANSWERS**

- 6 (a) 0
- (b) (i) 15,120      (ii) 3,024      (iii) 6,720      (iv) 120
- (c) (i) HHH, HHT, HTH, THH, HTT, THT, TTH, TTT
- (ii)  $\frac{1}{8}$       (iii)  $\frac{1}{2}$       (iv)  $\frac{7}{8}$