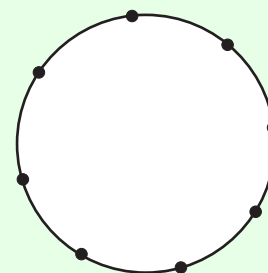


**COUNTING & PROBABILITY (Q 6, PAPER 2)**

**2001**

- 6 (a) Sarah and Jim celebrate their birthdays in a particular week (Monday to Sunday inclusive).  
Assuming that the birthdays are equally likely to fall on any day of the week, what is the probability that
- (i) Sarah's birthday is on Friday
  - (ii) Sarah's birthday and Jim's birthday are both on Friday?
- (b) (i) How many different arrangements can be made using all the letters of the word IRELAND?  
(ii) How many arrangements begin with the letter I?  
(iii) How many arrangements end with the word LAND?  
(iv) How many begin with I and end with LAND?

- (c) (i) Eight points lie on a circle, as in the diagram.  
How many different lines can be drawn by joining any two of the eight points?  
(ii) Find the value of the natural number  $n$  such that



$$\binom{n}{2} = 105.$$

[Note:  $\binom{n}{2}$  may also be written as  ${}^n C_2$ .]

**ANSWERS**

- 6 (a) (i)  $\frac{1}{7}$  (ii)  $\frac{1}{49}$   
(b) (i) 5,040 (ii) 720 (iii) 6 (iv) 2  
(c) (i) 28 (ii) 15