

$$\begin{aligned} \text{morning} &= 1.02(a_{n-1}) \\ \text{afternoon} &= 0.98 a_{n-1} \end{aligned}$$

$$a_n = (1.02 \times 0.98) a_{n-1}$$

$$a_n = 0.9996 a_{n-1}, \quad n \geq 1, \quad a_0 = 50$$

$$\text{ii) } a_1 = 0.9996 a_0$$

$$= 0.9996 a_0$$

$$= 0.9996 (50)$$

$$= 49.98$$

$$\therefore a_1 = \text{RM } 49.98$$

$$a_2 = 0.9996 a_1$$

$$= 0.9996 (49.98)$$

$$= 49.96$$

$$a_3 = 0.9996 a_2$$

$$= 0.9996 (49.96)$$

$$= 49.94$$

$$a_4 = 0.9996 a_3$$

$$= 0.9996 (49.94)$$

$$= 49.92$$

$$\begin{aligned} \text{2) } 5, \frac{37}{7}, \frac{39}{7}, \frac{41}{7}, \dots & \quad d = \frac{37}{7} - \frac{35}{7} \\ \frac{35}{7}, \frac{37}{7}, \frac{39}{7}, \frac{41}{7}, \dots & \quad = \frac{2}{7} \end{aligned}$$

$$\text{a) } a_n = a_{n-1} + \frac{2}{7}, \quad n \geq 2, \quad a_1 = 5$$

b) - Input : n

- Output : a(n)

- a(n) {

if (n=1)

return 5,

return  $a_{n-1} + \frac{2}{7}$

}

## Chapter 3

1) i) sum of 6 =  $\{(1,5), (2,4), (3,3), (4,2), (5,1)\}$

sum of 10 =  $\{(4,6), (5,5), (6,4)\}$

number of ways =  $5 + 3$

= 8 ways

ii)  $\{(1,3), (2,3), (3,3), (4,3), (5,3), (6,3), (3,1), (3,2), (3,4), (3,5), (3,6)\}$

number of ways = 11 ways

iii)  $\{(1,3), (2,3), (3,3), (4,3), (5,3), (6,3)\}$  ①

number of ways = 6 ways

2) i)  $2 \times 3 = 6$  ways

ii)  $(2 \times 3) \times (2 \times 3) = 36$  ways

3) i)  $4 \times 11 = 44$  ways

ii)  $4 \times 9 = 36$  ways

iii)  $4 \times 6 = 24$  ways

4)  $1 + 2 + 6 + 6 = 21$  options



3.2/3.3

- 1) i)  $26^3 \times 10^5 = 1757600000$  ways  
 ii)  ${}^1P_1 \times {}^1P_1 \times {}^{26}P_1 \times {}^{10}P_1 \times {}^{10}P_1 \times {}^{10}P_1 \times {}^{10}P_1 \times {}^2P_1 = 520000$   
 iii)  ${}^{26}P_3 \times {}^{10}P_5 = 471744000$

- 2) i)  ${}^{10}C_3 = 120$  ways  
 ii)  ${}^{15}C_4 = 5005$  ways  
 iii)  ${}^8P_5 = 3360$  ways  
 $\therefore 2!$   
 iv)  ${}^{10}C_2 \times {}^7C_2 = 945$  ways

- 3)  ${}^{20}C_3 \times {}^{15}C_2 = 119700$  ways

3.4

- 1) Pigeon: people ( $n$ ) (40 people)  
 Pigeonhole: 12 month (January to December)

$$\left\lceil \frac{40}{12} \right\rceil = 4$$

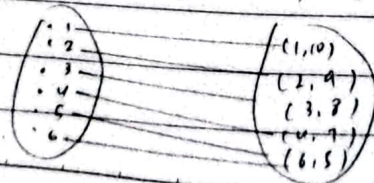
$\therefore$  at least 4 people in same month

- (A) 2) Pigeon: 35 student  
 Pigeonhole: 11 mark (90-100)

$$\left\lceil \frac{35}{11} \right\rceil = 4 \text{ people}$$

at least 4 people same mark.

- 3) Pigeon: 6 number picked  
 Pigeonhole: 5 set of number that sum is 11  
 $\{(1,10), (2,9), (3,8), (4,7), (6,5)\}$



Apply 2nd form of pigeon principle  
 as  $1 \times 1 > 14$ , at least one  
 pair of these 6 integer, their  
 sum is 11

STANDARD

STANDARD

- 4) pigeon : 115 different classes  
pigeonholes : 53 different time period.

$$\left\lceil \frac{115}{53} \right\rceil = 3$$

at least 3 different room needed.

- 5) pigeon : 25 computer  
pigeonhole : 24 computer can connect with that computer

$$\left\lceil \frac{25}{24} \right\rceil = 2$$

at least 2 computer connect to same computer.