Probability – AS Mathematics P2

1. June/2022/Paper_7356/02/No.14

Yingtai visits her local gym regularly.

After each visit she chooses one item to eat from the gym's cafe.

This could be an apple, a banana or a piece of cake.

She chooses the item independently each time.

The probability that Yingtai chooses each of these items on any visit is given by:

$$P(Apple) = 0.2$$

$$P(Banana) = 0.35$$

$$P(Cake) = 0.45$$

For any **four** randomly selected visits to the gym, find the probability that Yingtai chose:

(a)   at least one banana.

[2 marks]

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(b)   the same item each time.

[2 marks]

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(c)   apple twice and cake twice.

[3 marks]

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2. June/2022/Paper_7356/02/No.15

The discrete random variable X is modelled by the probability distribution defined by:

$$P(X = x) = \begin{cases} cx & x = 1, 2 \\ kx^2 & x = 3, 4 \\ 0 & \text{otherwise} \end{cases}$$

where k and c are constants.

(a) State, in terms of k, the probability that $X = 3$

[1 mark]

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(b) Given that $P(X \geq 3) = 3 \times P(X \leq 2)$

Find the exact value of k and the exact value of c.

[4 marks]

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