Binomial Distribution – 2022 AS June

1. March/2022/Paper_9709/52/No.2

In a certain country, the probability of more than $10\,\text{cm}$ of rain on any particular day is 0.18, independently of the weather on any other day.

(a) Find the probability that in any randomly chosen 7-day period, more than 2 days have more than $10\,\text{cm}$ of rain. [3]

(b) For 3 randomly chosen 7-day periods, find the probability that exactly two of these periods have at least one day with more than $10\,\text{cm}$ of rain. [3]

Janice is playing a computer game. She has to complete level 1 and level 2 to finish the game. She is allowed at most two attempts at any level.

- For level 1, the probability that Janice completes it at the first attempt is 0.6. If she fails at her first attempt, the probability that she completes it at the second attempt is 0.3.

- If Janice completes level 1, she immediately moves on to level 2.

- For level 2, the probability that Janice completes it at the first attempt is 0.4. If she fails at her first attempt, the probability that she completes it at the second attempt is 0.2.

(a) Show that the probability that Janice moves on to level 2 is 0.72. [1]

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(b) Find the probability that Janice finishes the game. [3]

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(c) Find the probability that Janice fails exactly one attempt, given that she finishes the game. [4]