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1. A bus company sells tickets for a journey from London to Oxford every Saturday.
Past records show that 5% of people who buy a ticket do not turn up for the journey.

The bus has seats for 48 people.
Each week the bus company sells tickets to exactly 50 people for the journey.

The random variable X represents the number of these people who do not turn up for the journey.

(a) State one assumption required to model X as a binomial distribution.

(1)

For this week's journey find,

(b) (i) the probability that all 50 people turn up for the journey,

(ii) $P(X = 1)$

(3)

The bus company receives £20 for each ticket sold and all 50 tickets are sold. It must pay out £60 to each person who buys a ticket and turns up for the journey but does not have a seat.

(c) Find the bus company's expected total earnings per journey.

(3)

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Question 1 continued

Q1

(Total 7 marks)