2. The manager of a supermarket records the number of complaints, x, the supermarket receives each day over a 50-day period. The results are summarised below.

$$\sum x = 99 \text{ and } \sum (x - \bar{x})^2 = 97.5$$

The manager believes that the number of complaints received by the supermarket each day could be modelled by a Poisson distribution.

(a) Show how the results above support the manager in his belief.

(3)

The manager uses a Poisson distribution with mean 2 to model the number of complaints received each day.

(b) For a randomly selected day, find using the manager's model, the probability that there are

(i) at least 4 complaints received,

(ii) more than 2 but less than 7 complaints received.

(4)

A working week consists of 5 consecutive days.

In a randomly selected working week, the supermarket received 17 complaints.

(c) Test, at the 5% level of significance, whether there is significant evidence that the mean number of complaints received is greater than 2 per day.
State your hypotheses clearly.

(5)

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Question 2 continued

(Total for Question 2 is 12 marks)