5. A supermarket receives complaints at a mean rate of 6 per week.

(a) State one assumption necessary, in order for a Poisson distribution to be used to model the number of complaints received by the supermarket.

(1)

(b) Find the probability that, in a given week, there are

(i) fewer than 3 complaints received by the supermarket,

(ii) at least 6 complaints received by the supermarket.

(3)

In a randomly selected week, the supermarket received 12 complaints.

(c) Test, at the 5% level of significance, whether or not there is evidence that the mean number of complaints is greater than 6 per week.
State your hypotheses clearly.

(5)

Following changes made by the supermarket, it received 26 complaints over a 6-week period.

(d) Use a suitable approximation to test whether or not there is evidence that, following the changes, the mean number of complaints received is less than 6 per week.
You should state your hypotheses clearly and use a 5% significance level.

(7)

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Question 5 continued

(Total for Question 5 is 16 marks)