**1.** A shop sells shoes at a mean rate of 4 pairs of shoes per hour on a weekday.

(a) Suggest a suitable distribution for modelling the number of sales of pairs of shoes made per hour on a weekday.

**(1)**

(b) State one assumption necessary for this distribution to be a suitable model of this situation.

**(1)**

(c) Find the probability that on a weekday the shop sells

(i) more than 4 pairs of shoes in a one-hour period,

(ii) more than 4 pairs of shoes in each of 3 consecutive one-hour periods.

**(4)**

The area manager visits the shop on a weekday, the day after an advert for the shop appears in a local paper.

In a one-hour period during the manager's visit, the shop sells 7 pairs of shoes.
This leads the manager to believe that the advert has increased the shop's sales of pairs of shoes.

(d) Stating your hypotheses clearly, test at the 5% level of significance whether or not there is evidence of an increase in sales of pairs of shoes following the appearance of the advert.

**(5)**

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**Question 1 continued**

**(Total for Question 1 is 11 marks)**

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