

2. A restaurant has only two options, a meat option (menu A) and a meat-free option (menu B).

The restaurant manager knows that 29% of customers choose menu B.

The manager decides to use a binomial distribution to model the number of customers choosing menu B.

The restaurant serves 40 customers each evening.

- (a) Using the manager's model, show that, on a randomly selected evening, the probability that more than a quarter of the customers choose menu B is 0.641 to 3 significant figures.

(2)

The restaurant is open 5 evenings each week.

- (b) (i) Find the probability that in a randomly selected week, more than a quarter of customers choose menu B on one evening or fewer.

(3)

- (ii) Give one assumption necessary for the answer to part (b)(i) to be valid.

(1)

The manager decides to change menu B from meat-free to vegan.

On a randomly selected evening after this change, 6 out of the 40 customers chose menu B.

- (c) Using a suitable hypothesis test, investigate whether the proportion of customers choosing menu B has changed.

You should use a 5% level of significance and state your hypotheses clearly.

(4)