

- 3 A traffic expert claims that the number of breakdowns occurring each day on a busy section of a motorway follows a Poisson distribution with mean 0.7. The number of breakdowns each day over a 200-day period was recorded. The following table contains the observed frequencies together with some of the expected frequencies using the expert's distribution.

Number of breakdowns per day	0	1	2	3	4	≥ 5
Observed frequency	88	73	26	7	3	3
Expected frequency	99.317	m	24.333	5.678	0.994	n

- (a) Find the value of m and the value of n , correct to 3 decimal places. [2]

- (b) Carry out a goodness of fit test at the 5% significance level to investigate the expert's claim. [6]

[illegible]

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- 3 Eggs in a supermarket are sold in boxes of six. A supermarket manager wishes to model the number of broken eggs in the boxes sold in the store. A random sample of 2000 boxes is taken and the number of broken eggs recorded. The observed frequencies are shown in the table below.

Number of broken eggs	0	1	2	3	4	5	6
Observed frequency	1844	143	11	0	1	0	1

- Test, at the 10% significance level, whether performance is independent of age of student. [7]

The observed frequencies and the expected frequencies are given in the following table.

(b) Show that $a = 162.6$ correct to 1 decimal place. [1]

- 1 A person's eye colour may be categorised as "brown", "blue" or "other". A scientist claims that these eye colours are uniformly distributed and hence are equally likely to occur in the population. A survey of 120 people from this population found that 38 people had brown eyes, 52 people had blue eyes and 30 people had eyes which were neither brown nor blue.

Use the data to carry out a goodness of fit test at the 5% significance level to test the scientist's claim. [6]

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