A shop is supplied with large quantities of plant pots in packs of six. These pots can be damaged easily if they are not packed carefully. The manager of the shop is a statistician and he believes that the number of damaged pots in a pack of six has a binomial distribution. He chooses a random sample of 250 packs and records the numbers of damaged pots per pack. His results are shown in the following table.

Number of damaged pots per pack (x)	0	1	2	3	4	5	6
Frequency	48	69	78	32	22	1	0

(i) Show that the mean number of damaged pots per pack in this sample is 1.656. [1]

The following table shows some of the expected frequencies, correct to 2 decimal places, using an appropriate binomial distribution.

Number of damaged pots per pack (x)	0	1	2	3	4	5	6
Expected frequency	36.01	82.36	a	39.89	b	1.74	0.11

(ii) Find the values of a and b, correct to 2 decimal places [5]

(iii) Use a goodness-of-fit test at the 1% significance level to determine whether the manager's belief is justified. [8]