

- 12** A student has an ordinary six-sided dice. The student suspects that it is biased against six, so that when it is thrown, it is less likely to show a six than if it were fair.

In order to test this suspicion, the student plans to carry out a hypothesis test at the 5% significance level.

The student throws the dice 100 times and notes the number of times, X , that it shows a six.

- (a)** Determine the largest value of X that would provide evidence at the 5% significance level that the dice is biased against six. **[3]**

Later another student carries out a similar test, at the 5% significance level. This student also throws the dice 100 times.

- (b)** It is given that the dice is fair.

Find the probability that the conclusion of the test is that there is significant evidence that the dice is biased against six. **[1]**