12 The variable X has the distribution $B(50, \frac{1}{6})$. The probabilities $P(X = r)$ for $r = 0$ to 50 are given by the terms of the expansion of $(a+b)^n$ for specific values of a, b and n.

(a) State the values of a, b and n. **[1]**

A student has an ordinary 6-sided dice. They suspect that it is biased so that it shows a 2 on fewer throws than it would if it were fair. In order to test the suspicion the dice is thrown 50 times and the number of 2s is noted. The student then carries out a hypothesis test at the 5% significance level.

(b) Write down suitable hypotheses for the test. **[2]**

(c) Determine the rejection region for the test, showing the values of any relevant probabilities. **[4]**