11 Casey and Riley attend a large school. They are discussing the music preferences of the students at their school. Casey believes that the favourite band of 75% of the students is Blue Rocking. Riley believes that the true figure is greater than 75%.

They plan to carry out a hypothesis test at the 5% significance level, using the hypotheses H_0: $p = 0.75$ and H_1: $p > 0.75$.

They choose a random sample of 60 students from the school, and note the number, X, who say that their favourite band is Blue Rocking.

They find that $X = 50$.

(a) Assuming the null hypothesis to be true, Riley correctly calculates that $P(X = 50) = 0.0407$, correct to 3 significant figures.

Riley says that, because this value is less than 0.05, the null hypothesis should be rejected.

Explain why this statement is incorrect. **[1]**

(b) Carry out the test. **[5]**

(c) (i) State which mathematical model is used in the calculation in part **(b)**, including the value(s) of any parameter(s). **[1]**

(ii) The random sample was chosen without replacement.

Explain whether this invalidates the model used in part **(b)**. **[1]**