

- 13** Some students at a large school are doing a survey about attitudes to school uniform. They want to give a questionnaire to a random sample of 50 students at their school.

The school has three entrances. Gabi suggests giving the questionnaire to the first 50 students who arrive at a particular entrance on a randomly chosen morning.

- (a)** Give **two** reasons why this method of sampling will **not** produce a random sample. [2]

The students are also doing a survey about attitudes to school lunches. Jane claims that 30% of students think the lunches are satisfactory. Dev claims that the true percentage is less than 30%. The students decide to test Jane's claim by taking a **random** sample of 50 students and noting the number who think the lunches satisfactory.

Out of the 50 students in the sample, 9 said that they thought the lunches are satisfactory.

- (b)** Using a binomial distribution as a model, test Jane's claim against Dev's claim at the 5% significance level. [7]
- (c)** The sample used by the students was taken without replacement. One student suggests that this means that one of the assumptions underlying the model is **not** valid.

Explain whether you agree with this statement. [1]