8 In 2018 research showed that 81% of young adults in England had never donated blood.

Following an advertising campaign in 2021, it is believed that the percentage of young adults in England who had never donated blood in 2021 is less than 81%.

Ling decides to carry out a hypothesis test at the 5% level.

Ling collects data from a random sample of 400 young adults in England.

(a) State the null and alternative hypotheses for the test, defining the parameter used. **[2]**

(b) Write down the probability that the null hypothesis is rejected when it should in fact be accepted. **[1]**

(c) Assuming the null hypothesis is correct, calculate the expected number of young adults in the sample who had never donated blood. **[1]**

(d) Calculate the probability that there were no more than 308 young adults who had never donated blood in the sample. **[1]**

(e) Determine the critical region for the test. **[3]**

In fact, the sample contained 314 young adults who had never donated blood.

(f) Carry out the test, giving the conclusion in the context of the question. **[3]**