

- 13** A large supermarket chain advertises that the mean mass of apples of a certain variety on sale in their stores is 0.14 kg.

Following a poor growing season, the head of quality control believes that the mean mass of these apples is less than 0.14 kg and she decides to carry out a hypothesis test at the 5% level of significance.

She collects a random sample of this variety of apple from the supermarket chain and records the mass, in kg, of each apple. She uses software to analyse the data. The results are summarised in the output below.

n	80
Mean	0.1316
$\sigma$	0.0198
s	0.0199
$\Sigma x$	10.525
$\Sigma x^2$	1.4161
Min	0.1
Q1	0.12
Median	0.132
Q3	0.1435
Max	0.19

- (a) State the null hypothesis and the alternative hypothesis for the test, defining the parameter used. [2]
- (b) Write down the distribution of the sample mean for this hypothesis test. [2]
- (c) Determine the critical region for the test. [2]
- (d) Carry out the test, giving your conclusion in context. [3]