

11 Zac is planning to write a report on the music preferences of the students at his college. There is a large number of students at the college.

(a) State one reason why Zac might wish to obtain information from a sample of students, rather than from all the students. **[1]**

(b) Amaya suggests that Zac should use a sample that is stratified by school year.

Give one advantage of this method as compared with random sampling, in this context. **[1]**

Zac decides to take a random sample of 60 students from his college. He asks each student how many hours per week, on average, they spend listening to music during term. From his results he calculates the following statistics.

Mean	Standard deviation	Median	Lower quartile	Upper quartile
21.0	4.20	20.5	18.0	22.9

- (c) Sundip tells Zac that, during term, she spends on average 30 hours per week listening to music.

Discuss briefly whether this value should be considered an outlier.

[3]

- (d) Layla claims that, during term, each student spends on average 20 hours per week listening to music. Zac believes that the true figure is higher than 20 hours. He uses his results to carry out a hypothesis test at the 5% significance level.

Assume that the time spent listening to music is normally distributed with standard deviation 4.20 hours.

Carry out the test.

[7]