



“FRAPPY” {Free Response AP Problem...Yay!}

The following problem is taken from an actual Advanced Placement Statistics Examination. Your task is to generate a complete, concise statistical response in 25 minutes. You will be graded based on the AP rubric and will earn a score of 0-4. After grading, keep this problem in your binder for your AP Exam preparation.

In September 1990, each student in a random sample of 200 biology majors at a large university was asked how many lab classes he or she was enrolled in. The sample results are shown below.

Number of Lab Classes	Number of Students
0	28
1	62
2	58
3	28
4	16
5	8
(Total)	200

$$\bar{x} = 1.83$$
$$s = 1.29$$

To determine whether the distribution has changed over the past 10 years, a similar survey was conducted in September 2000 by selecting a random sample of 200 biology majors. Results from the year 2000 sample are shown below.

Number of Lab Classes	Number of Students
0	20
1	72
2	60
3	10
4	26
5	12
(Total)	200

$$\bar{x} = 1.93$$
$$s = 1.37$$

Scoring:

- (a) Do the data provide evidence that the mean number of lab classes taken by biology majors in September 2000 was different from the mean number of lab classes taken in 1990? Perform an appropriate statistical test using $\alpha = 0.10$ to answer this question.

(b) Does the test in (a) address the question of whether the distribution of number of lab classes was different in 2000 than it was in 1990? If so, explain your reasoning. If not, carry out an appropriate statistical test using $\alpha = 0.10$ to answer this question.

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(c) Use the results of your analyses in (a) and (b) to write a few sentences that summarize how the distribution of the number of lab classes did or did not differ. Use appropriate graphs to help communicate your message. This summary should be understandable to someone who has not studied statistics.

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Total: __/4