

**AP<sup>®</sup> STATISTICS**  
**2004 SCORING GUIDELINES (Form B)**

**Question 2**

**Solution**

**Part (a):**

Since the manager used a convenience sample (the first 100 students entering the cafeteria), bias may have been introduced. Students who arrive at the cafeteria early may have opinions of food quality that differ in some important way from other students who live in the dormitories.

This bias could be avoided by selecting a random sample of 100 dormitory residents instead of just asking the first 100 students entering the cafeteria.

**Part (b):**

The way the question is worded may be leading. The first part of the question included a statement that many students think the food needs improvement. This may lead people to support this view by responding that the food does need improvement.

The inclusion of the phrase "even though that would increase the cost of the meal plan" may lead students to say the food is OK only because they do not want to pay more.

A better wording might be to simply ask "Do you think that the quality of the food served in the cafeteria needs improvement?"

**Scoring**

Each part is scored as either essentially correct, partially correct, or incorrect.

**Part (a)** is essentially correct if the response

1. indicates that selecting the first 100 students to arrive at the cafeteria could introduce bias because opinions of the first 100 students might differ from the opinions of other students who live in the dormitories
2. proposes a reasonable alternative that involves random selection—a simple random sample of dorm residents, or some sort of stratified random sample, or a systematic sample with a random starting point.

**Part (a)** is partially correct if the response

indicates why selecting the first 100 students to arrive is not reasonable, but proposes an alternative that does not involve random selection

OR

proposes a reasonable alternative that involves random selection, but does not explain how selecting the first 100 students could introduce bias.

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**Question 2 (cont'd.)**

**Part (b)** is essentially correct if the response

1. points out at least one of the two possible problems with the question wording
2. proposes reasonable alternate wording that addresses the concern(s) raised.

Note: The student only needs to identify one problem and take care of it. If only one of the two wording concerns is raised, the alternate wording need only address the one wording problem. However, if the student identifies both problems, appropriate alternate wording must be provided for both problems.

Part (b) is partially correct if the response

identifies one or both of the potential wording problems, but does not propose a new wording that adequately addresses an identified problem.

Part (b) is incorrect if the response

points out both wording problems, but then argues that the question wording is OK as is because the biases are in opposing directions and so will balance each other.

**4 Complete Response**

Both parts essentially correct

**3 Substantial Response**

One part essentially correct and the other part partially correct

**2 Developing Response**

One part essentially correct and the other part incorrect  
OR  
Both parts partially correct

**1 Minimal Response**

One part partially correct