AP® STATISTICS
2006 SCORING GUIDELINES (Form B)

Question 1

Intent of Question

The primary purpose of this question is to assess a student's ability to read, interpret, and explain information contained in a cumulative relative frequency plot for a real estate company.

Solution

Part (a):

This point indicates that 40 percent of the sales agents at this real estate company had sales volume of $300,000 or less in the month shown.

Part (b):

Eighty percent of the sales agents had sales volume of $800,000 or less and 70 percent of the sales agents had sales volume of $700,000 or less. Thus, $0.8 - 0.7 = 0.1$ or 10 percent of the sales agents achieved monthly sales volumes greater than $700,000 and not exceeding $800,000.

Part (c):

There were no agents whose monthly sales volume was between $1,000,000 and $1,100,000.

Part (d):

The 80^{th} percentile for the distribution of monthly sales volume by these agents during the preceding month is $800,000. Therefore, an agent making more than $800,000 will be in the top 20 percent.

Scoring

Parts (a), (c), and (d) are scored as essentially correct (E), partially correct (P), or incorrect (I). Part (b) is scored as essentially correct (E) or incorrect (I).

Part (a) is essentially correct (E) if both values are correctly identified and interpreted in the appropriate context.

Part (a) is partially correct (P) if incorrect values are read from the plot, but the interpretation is correct OR one of the values is not interpreted correctly in the context of the question.

Part (a) is incorrect (I) if the student fails to recognize the cumulative nature of the graph, for example, the student says 40 percent of the sales agents had a sales volume of $300,000.

Part (b) is essentially correct (E) if 0.1 (or 10 percent) is provided AND work is shown or an appropriate explanation is provided.

Part (b) is incorrect (I) if an answer (0.1, 0.8, or anything else) is provided with no supporting work or explanation.

Question 1 (continued)

Note: Probability statements are OK and work may be provided on the graph.

Alternative solution to Part (b):

Let X represent monthly sales volume (in hundreds of thousands of dollars)

$P(7 < X \leq 8) = P(X \leq 8) - P(X \leq 7) = 0.8 - 0.7 = 0.1$, so 0.1 (or 10 percent) of the sales agents achieved monthly sales volumes greater than \$700,000 and not exceeding \$800,000.

Part (c) is essentially correct (E) if the student indicates that none of the sales agents had a monthly sales volume between \$1 million and \$1.1 million.

Part (c) is partially correct (P) if the student recognizes that no events occurred between 10 and 11 but does not provide a correct description in the context of this problem.

Part (c) is incorrect (I) otherwise, for example, if the student says the number of agents with \$1 million in sales is the same as the number of agents with \$1.1 million in sales, or if the student says that the frequency of sales of \$1 million is the same as the frequency of sales of \$1.1 million.

Part (d) is essentially correct (E) if a minimum monthly sales volume above \$800,000 is identified or the student says anything above \$800,000 will qualify the agent for a bonus AND justification for selecting that value is provided using the complement rule or the graph.

Part (d) is partially correct (P) if the minimum monthly sales volume is specified as \$800,000 with no justification.

Part (d) is incorrect (I) if an incorrect minimum monthly sales volume is specified OR a value is specified without context.

Each essentially correct response is worth 1 point; each partially correct answer is worth ½ point.

4 **Complete Response**

3 **Substantial Response**

2 **Developing Response**

1 **Minimal Response**

If a response is between two scores (for example, 2½ points), use a holistic approach to determine whether to score up or down depending on the strength of the response and communication.