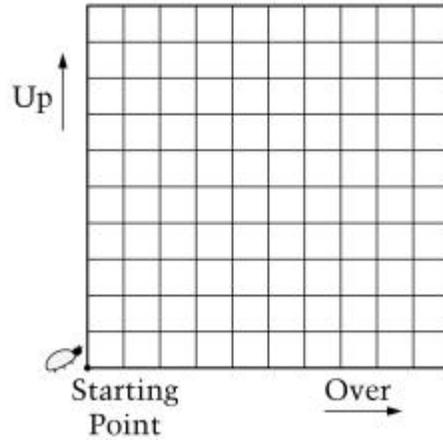


If the grid in Question 10 were large enough and the beetle continued to move in the same pattern, would the point that is 75 blocks up and 100 blocks over from the starting point be on the beetle's path?



- A Yes B No

Give a reason for your answer.

Scoring Guide

Solution:

The beetle moves up 1 and 2 to the right each time. The ratio is 1 up and 2 to the right. 75 up and 100 to the right would NOT be on the path since $1/2$ is not equal to $75/100$.

OR

If the beetle moves 1 up and 2 to the right each time, then it should move 50 up (not 75 up) and 100 to the right. It is not necessary to include both the 50 and 75 in a response, but the response should clearly indicate that 75 will not work with 100, and relate it to $1/2$ or that 50 will work with 100 and relate it to $1/2$ or that 75 will work with 150 and relate it to $1/2$.

Score & Description

Correct

Correct response

Partial

Response indicates that there is a pattern, but the pattern may not be the correct 1 up and 2 to the right. Any “2” response should clearly mention or allude to some number up and some number to the right, but the numbers do not necessarily have to be 1 and 2.

The “2” category will also include incomplete explanations with some correct information (that indicates that a pattern exists).

Incorrect

Incorrect response – includes all responses that just repeat information in the prompt and those that indicate that “the pattern is up and to the right”, as well as all other incorrect responses.

Correct - Student Response

If the grid in Question 10 were large enough and the beetle continued to move in the same pattern, would the point that is 75 blocks up and 100 blocks over from the starting point be on the beetle’s path?

The Beetle moves over 2 and up 1 so 100 blocks over would be 50 up not 75.

Scorer Comments:

This response received full credit. The student correctly explained that the point 75 blocks up and 100 blocks over would not be in the beetle’s path given the way that it makes each move.

Partial - Student Response

If the grid in Question 10 were large enough and the beetle continued to move in the same pattern, would the point that is 75 blocks up and 100 blocks over from the starting point be on the beetle’s path?

He will touch every point going up because he only moves one block, and will touch point 100 because it is an even number and he is moving over in 2's.

Scorer Comments:

This response received partial credit because the student gave some correct information. The student recognized that the beetle could be at the point 75 blocks up, but then they failed to consider that it could not be 100 blocks over given the way that it makes each move.

Incorrect - Student Response

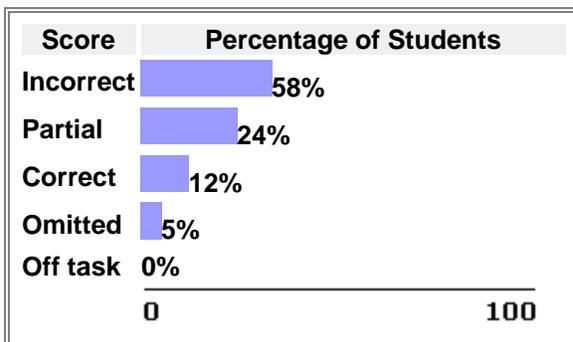
If the grid in Question 10 were large enough and the beetle continued to move in the same pattern, would the point that is 75 blocks up and 100 blocks over from the starting point be on the beetle's path?

The beetle would still be moving in the same pattern, it would eventually get to the other side of the grid.

Scorer Comments:

This response received no credit because the explanation the student gave does not answer the question.

2005 National Performance Results



Note:

- These results are for public and nonpublic school students.
- Percentages may not add to 100 due to rounding.

Mathematical Content Area: *Algebra* (Sub content classification:)
Mathematical Complexity: *High Complexity*

Mathematical Content Area

Algebra

This content area focuses on students' understanding of patterns, relations, and functions; algebraic representation; variables, expressions, and operations; and equations and inequalities. At grade 4, students are expected to show knowledge of simple patterns and expressions; at grade 8 this knowledge extends to include linear equations; and at grade 12 it extends further to include quadratic and exponential equations and functions. Representational skills, such as students' ability to translate between different forms of representation (e.g., from a written description to an equation), the ability to graph and interpret points located on a coordinate system, and the ability to use algebraic properties to draw a conclusion, are assessed in this area. Students may be asked to express relationships algebraically as number sentences, equations, or inequalities; manipulate algebraic expressions; or solve and interpret algebraic equations and inequalities that are grade-level appropriate.

Mathematical Complexity

High Complexity

High-complexity items make heavy demands on students, who must engage in more abstract reasoning, planning, analysis, judgment, and creative thought. A satisfactory response to the item requires that the student think in an abstract and sophisticated way.

Description	Grade	Type	Difficulty
Reason about pattern on grid using concept of slope	8th	Short Constructed Response	Hard