Writing and Scoring Test Questions

Based on

Ohio's Academic Content Standards

Constructed Response Scoring Guide

Grade 7

Mathematics

Item 2948

Ohio Achievement Test
Secure Materials

Item: ITS ID: 2948

Julius has created a number pattern. The first number in his pattern is 1. Then, he says, "the next number in my pattern can always be determined by multiplying the previous number by 2 and then adding 3."

In your **Answer Document**, copy and complete the table showing the first six numbers in Julius' number pattern.

Term	1	2	3	4	5	6
Number	1					

Use the table to decide if Julius' number pattern changes at a constant rate and explain how you know.

Julius claims that 100 cannot be a number in his pattern. Explain whether Julius' claim is valid and how you know.

Scoring Guidelines

Points	Student Response
4	Sample Correct Responses: • $2(1) + 3 = 5$ $2(5) + 3 = 13$ $2(13) + 3 = 29$ $2(29) + 3 = 61$ $2(61) + 3 = 125$ AND The numbers do not increase the same amount each time. AND Julius' claim is correct because 100 is an even number and all the numbers in the pattern are odd numbers. There are no terms between 5 and 6 that would give 100. The focus of the task is representing and analyzing patterns, rules and functions with words, tables, graphs and simple variable expressions. The response provides an accurate table showing the first six numbers in Julius' number pattern. The response provides an adequate explanation as to whether the number pattern changes at a constant rate. The response also provides an adequate explanation on whether Julius' claim that 100 cannot be a number in his pattern is valid.

3	The response provides clear evidence of representing and analyzing patterns, rules and functions with words, tables, graphs and simple variable expressions; however, the solution is slightly flawed. For example, the response may: • Provide a table with a minor calculation error and two adequate explanations. • Provide a correct table and one correct explanation. Provide two correct explanations, using correct numbers from the table, but does not include a table.
2	The response provides partial evidence of representing and analyzing patterns, rules and functions with words, tables, graphs and simple variable expressions; however, the solution is incomplete or flawed. For example, the response may: • Provide a correct table showing the first six numbers in Julius' number pattern. Provide two correct explanations, but does not include a table.
1	The response provides minimal evidence of representing and analyzing patterns, rules and functions with words, tables, graphs and simple variable expressions; however, the solution is incomplete or flawed. For example, the response may: • Provide a table showing 3 or 4 correct terms in Julius' number pattern. • Provide an adequate explanation as to whether the number pattern changes at a constant rate, but does not include a table. • Provide an adequate explanation as to whether Julius' claim that 100 cannot be a valid number in his pattern, but does not include a table. Makes an error in the table and makes one valid explanation based on the table.
0	The response provides inadequate evidence of understanding of representing and analyzing patterns, rules and functions with words, tables, graphs and simple variable expressions. The response provides major flaws in reasoning or irrelevant information. For example, the response may: • State that 100 could end up being in the pattern because the pattern increases every time. • Be blank or make unrelated statements. • Copy information from the stem.

2

The response provides an adequate explanation as to whether the number pattern changes at a constant rate. The response also provides an adequate explanation on whether Julius' claim that 100 cannot be a number in his pattern is valid.

(5,13,29,61,125 The numbers do not change at a constant rate because the numbers don't follow the pattern that keep jumping around.. This claim is true because there is no number that you can multiply by 2 and add 3 to get 100.)

term	1	2	3	4	5	6	
Numb	1	5	13	29	61	125	

The numbers do not change at a constant rate because the numbers don't follow one pattern they keep on jumping around.

His claim is true because there is no number that you can multiple by 2 and add 3 to get 100.

SCORE:4

SG-1

The response provides clear evidence of representing and analyzing patterns, rules and functions with words, tables, graphs, and simple variable expressions; however, the solution is slightly flawed.

*(1,5,13,29,61,125. Julius claim is true because 61*2+3=123 so his cannot be a number in his pattern.)*

Term	1	2	3	4	5	6
Number	1	5	13	29	61	125

Julius' claim is true because 61 x 2 + 3 = 125 so 100 cannot be a number in his pattern.

SCORE:3

The response provides clear evidence of representing and analyzing patterns, rules and functions with words, tables, graphs, and simple variable expressions; however, the solution is slightly flawed.

(1,5,13,29,61,125 It could never be 100 because it skips straight to 125.)

Term	1	2	3	4	5	6
Number	1	5	13	29	61	125

It could never be 100 because it skips over it to 125.

SCORE:3

Number: 00113 Score: 3

SG-3

The response provides clear evidence of representing and analyzing patterns, rules and functions with words, tables, graphs, and simple variable expressions; however, the solution is slightly flawed.

(1,5,13,29,61,125 Julius claim is valid because the pattern does not contain 100 the pattern skips 100)

Term	1	2	3	4	5	6
Number	1	5	13	29	61	125

Yes, Julius number pattern changes at a constant rate because he uses the same pattern.

Julius's claim is valid because the pattern does not contain 100, the pattern skips 100.

SCORE:3

The response provides partial evidence of representing and analyzing patterns, rules and functions with words, tables, graphs and simple variable expressions; however, the solution is incomplete or flawed.

(1,5,13,29,61,125)

Term	1	2	3	4	5	6
number	1	5	13	29	61	125

Julios' claim is valid because 100 could not be divided by 2 and then subtracted by 3 and get a whole number

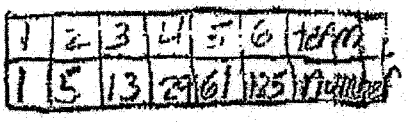
SCORE:2

Number: 00009 Score: 2

SG-5

The response provides partial evidence of representing and analyzing patterns, rules and functions with words, tables, graphs and simple variable expressions; however, the solution is incomplete or flawed.

(1,5,13,29,61,125)



SCORE:2

Number: 00120 Score: 2 **SG-6**

The response provides minimal evidence of representing and analyzing patterns, rules and functions with words, tables, graphs and simple variable expressions; however, the solution is incomplete or flawed.

*(1,5,13,29,90,183 He is correct. 100 cannot go into this chart if you follow the equation 90*2=180+3=183 so 100 can't go into it.)*

Term	1	2	3	4	5	6	7
Number	1	5	13	29	90	183	

He is correct 100 can not go into this chart if you follow the direction $90 \times 2 = 180 + 3 = 183$ So 100 cant go in to it

SCORE:1

Number: 00033 Score: 1

SG-7

The response provides minimal evidence of representing and analyzing patterns, rules and functions with words, tables, graphs and simple variable expressions; however, the solution is incomplete or flawed.

(7,9,11,13,15 Julius pattern changes does change at a constant rate because on the number pattern the numbers keep going up by 2. No 100 can not be in the pattern because all the numbers are odd.)

term	1	2	3	4	5	6
Number	1	7	9	11	13	15

Julios pattern changes does change at a constant rate because on the number pattern the numbers keep going up by 2. No, 100 cannot be in the pattern because all the numbers are odd.

SCORE:1

Number: 00035 Score: 1

SG-8

	The response provides inadequate evidence of understanding of representing and analyzing patterns, rules and functions with words, tables, graphs and simple variable expressions. The response provides major flaws in reasoning or irrelevant information.

Term	1	2	3	4	5	6
Number	4					

keep going 4,8,3,4,5,6

SCORE:0

Number: 00013 Score: 0 **SG-9**