

# 2023 MCAS Sample Student Work and Scoring Guide

## Grade 8 Mathematics

### Question 5: Constructed-Response

**Reporting Category:** Functions

**Standard:** [8.F.B.4](#) - Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two  $(x, y)$  values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

**Item Description:** Use the linear relationship represented in a table to determine the y-intercept and slope; to write the equation of the line; and to determine whether a given point falls on the line.

**Calculator:** Not allowed

[View item in MCAS Digital Item Library](#)

### Scoring Guide

Select a score point in the table below to view the sample student response.

Score*	Description
<a href="#">4A</a>	The student response demonstrates an exemplary understanding of the Functions concepts involved in constructing a function to model a linear relationship between two quantities. The student determines the y-intercept, rate of change, and equation from a table, and uses the equation to solve a problem.
<a href="#">4B</a>	
<a href="#">3</a>	The student response demonstrates a good understanding of the Functions concepts involved in constructing a function to model a linear relationship between two quantities. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is flawed. As a result, the response merits 3 points.
<a href="#">2</a>	The student response demonstrates a fair understanding of the Functions concepts involved in constructing a function to model a linear relationship between two quantities. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
<a href="#">1</a>	The student response demonstrates a minimal understanding of the Functions concepts involved in constructing a function to model a linear relationship between two quantities.
<a href="#">0</a>	The student response contains insufficient evidence of an understanding of the Functions concepts involved in constructing a function to model a linear relationship between two quantities. As a result, the response does not merit any points.

\*Letters are used to distinguish between sample student responses that earned the same score (e.g., 4A and 4B).

**Score Point 4A**

This question has four parts.

A student created this table to represent a linear relationship between  $x$  and  $y$ .

$x$	$y$
-2	10.0
-1	7.5
0	5.0
1	2.5
2	0

**Part A**

What is the  $y$ -intercept of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The  $y$  intercept is (0,5.0)

It shows in the table that when  $x$  is 0, 5 is  $y$ . This shows where the starting point is.

**Part B**

What is the slope of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$(-2,10), (-1,7.5)$

$$\frac{(7.5 - 10)}{(-1 + 2)} = -2.5$$

$$m = -2.5$$

**Part C**

Write an equation of the line represented by the relationship between  $x$  and  $y$  shown in the table.

Enter your equation in the space provided.

$$y = -2.5x + 5$$

**Part D**

The student says the point  $(9, -17.5)$  lies on the line represented by the relationship between  $x$  and  $y$  shown in the table.

Is the student correct? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$y = -2.5x + 5$$
$$-17.5 = -2.5(9) + 5$$
$$-17.5 = -22.5 + 5$$
$$-17.5 = -17.5$$

The student is correct.

**Score Point 4B**

This question has four parts.

A student created this table to represent a linear relationship between  $x$  and  $y$ .

$x$	$y$
-2	10.0
-1	7.5
0	5.0
1	2.5
2	0

**Part A**

What is the  $y$ -intercept of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The  $y$  intercept of the line is 5. I know this because one of the coordinates is (0,5), so that would be where the line crosses the  $y$  axis, so the  $y$  intercept is 5.

**Part B**

What is the slope of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$\frac{10 - 5}{-2 - 0} = \frac{5}{-2}$$

The slope is  $\frac{5}{-2}$ , and I know this because I used two given coordinates to calculate it.

**Part C**

Write an equation of the line represented by the relationship between  $x$  and  $y$  shown in the table.

Enter your equation in the space provided.

$$y = \frac{5}{-2}x + 5$$

**Part D**

The student says the point  $(9, -17.5)$  lies on the line represented by the relationship between  $x$  and  $y$  shown in the table.

Is the student correct? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$-17.5 = \frac{-5}{2} \cdot 9 + 5$$

$$-17.5 = \frac{-45}{2} + 5$$

$$-17.5 = -22.5 + 5$$

$$-17.5 = -17.5$$

The student is correct. I got this answer by plugging the points into the equation and checking to see if it fit, and it did fit.

**Score Point 3**

This question has four parts.

A student created this table to represent a linear relationship between  $x$  and  $y$ .

$x$	$y$
-2	10.0
-1	7.5
0	5.0
1	2.5
2	0

**Part A**

What is the  $y$ -intercept of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The  $y$  – *intercept* of the line is 5. I got my answer by using the table. To find the  $y$  – *intercept* of an equation, the  $x$  – *coordinate* must be zero. Therefore, when I looked at the data in the table, I found the data set that contained an  $x$  – *coordinate* of zero. The  $y$  – *coordinate* that went with the  $x$  – *coordinate* of zero was five. Thus, the  $y$  – *intercept* is 5.

**Part B**

What is the slope of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$m = \text{change in } y / \text{change in } x = \frac{y - y}{x - x}$$

$$m = \frac{10 - 7.5}{-2 - -1} = \frac{2.5}{-1} = -2.5$$

$$m = -2.5$$

**Part C**

Write an equation of the line represented by the relationship between  $x$  and  $y$  shown in the table.

Enter your equation in the space provided.

$$y = -2.5 + 5$$

**Part D**

The student says the point  $(9, -17.5)$  lies on the line represented by the relationship between  $x$  and  $y$  shown in the table.

Is the student correct? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$y = -2.5 + 5$$

$$-17.5 = -2.5(9) + 5$$

$$-17.5 = -22.5 + 5$$

$$-17.5 = -17.5$$

The student is correct.

**Score Point 2**

This question has four parts.

A student created this table to represent a linear relationship between  $x$  and  $y$ .

$x$	$y$
-2	10.0
-1	7.5
0	5.0
1	2.5
2	0

**Part A**

What is the  $y$ -intercept of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

10

**Part B**

What is the slope of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$\frac{-2.5}{1}$



**Part C**

Write an equation of the line represented by the relationship between  $x$  and  $y$  shown in the table.

Enter your equation in the space provided.

$$y = \frac{-2.5}{1} + 10$$

**Part D**

The student says the point  $(9, -17.5)$  lies on the line represented by the relationship between  $x$  and  $y$  shown in the table.

Is the student correct? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The student is correct.

3, -2.5

4, -5.0

5, -7.5

6, -10.0

7, -12.5

8, -15.0

9, -17.5

**Score Point 1**

This question has four parts.

A student created this table to represent a linear relationship between  $x$  and  $y$ .

$x$	$y$
-2	10.0
-1	7.5
0	5.0
1	2.5
2	0

**Part A**

What is the  $y$ -intercept of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

5, because that is where it hits  $x = 0$  so it must intercept  $y$  at that value

**Part B**

What is the slope of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

the slope is 2 because that is where the line intercepts  $x$

**Part C**

Write an equation of the line represented by the relationship between  $x$  and  $y$  shown in the table.

Enter your equation in the space provided.

$y = -2x$  because negative 2 is where y is 10

**Part D**

The student says the point  $(9, -17.5)$  lies on the line represented by the relationship between  $x$  and  $y$  shown in the table.

Is the student correct? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

the student is correct because the point corresponds with the equation.

[Back to Scoring Guide](#)

**Score Point 0**

This question has four parts.

A student created this table to represent a linear relationship between  $x$  and  $y$ .

$x$	$y$
-2	10.0
-1	7.5
0	5.0
1	2.5
2	0

**Part A**

What is the  $y$ -intercept of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

2 is the y intercept because you know its the y intercept when on the table the (y) box that corallates with it is 0

**Part B**

What is the slope of the line represented by the  $x$  and  $y$  values shown in the table? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

-5 is the slope because  $\frac{10}{-2} = -5$  and also because  $-5x - 2 = 10$

**Part C**

Write an equation of the line represented by the relationship between  $x$  and  $y$  shown in the table.

Enter your equation in the space provided.

$$y = -5 + 2$$

**Part D**

The student says the point  $(9, -17.5)$  lies on the line represented by the relationship between  $x$  and  $y$  shown in the table.

Is the student correct? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

the student is not correct because if you continue the table all the way till the x collumn is at 10 while following the same pattern you will see that y is also 10 so by the time its x value is at 10 its not even close to the value of y to be at  $-17.5$

[Back to Scoring Guide](#)