

TCAP/CRA 2012-2013

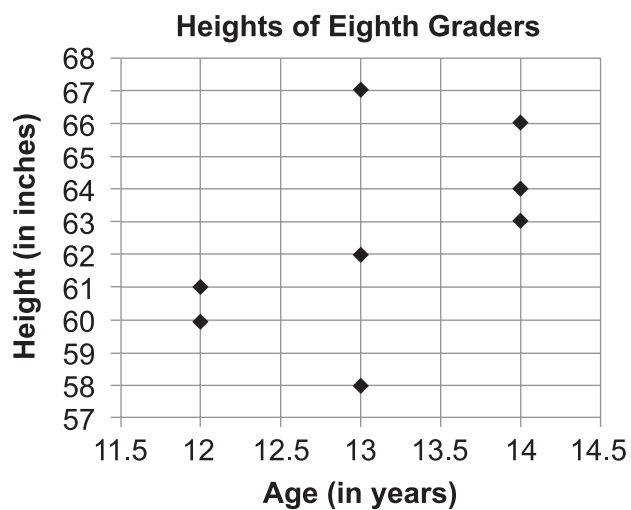


Task 3: Heights of 8th Graders Task

NOTE: This is the universally scored task for Grade 8. Please visit www.tncore.org for more information on Phase II updates and changes.

Full Scoring Guide

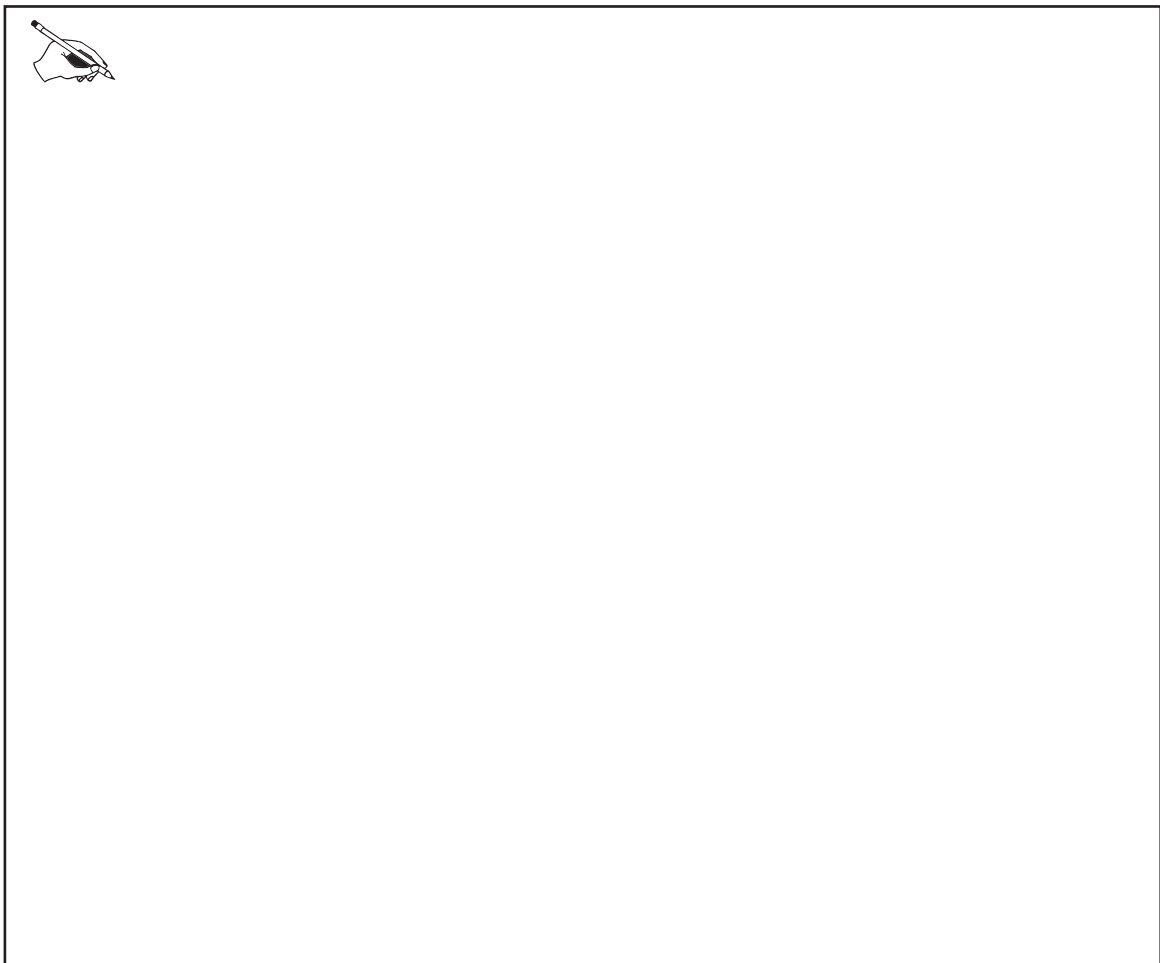
Task 3. Heights of 8th Graders Task



- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in inches)	Age (in years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14



3. Heights of Eighth Graders Task Scoring Guide

The CCSS for Mathematical Content (2 points)

- 8.F.1(a) The student determines whether the data in Part A are a function. The student may do this in one of the following ways: _____
- by using ordered pairs to show that at least two ordered pairs have the same x -values and different y -values.
 - by drawing a vertical line on the graph at a particular x -value and demonstrating that there is more than one y -value for that x -value.
- 8.F.1(b) The student determines that Leda is correct in her assertion that the data represents a function in Part B by using one of the following methods: _____
- using ordered pairs to show that no two ordered pairs have the same y -values for a single x -value.
 - making a graph of the data set, draws a vertical line at each x -value, and showing that there is no more than one data point on that line.
 - applying an understanding of the vertical line test in determining whether the data represents a function.

Total Content Points _____

The CCSS for Mathematical Practice (3 points)

- MP1 The student determines if each data set meets the definition of a function. The student completes both parts of the problem. _____
(MP1: Make sense of problems and persevere in solving them.)
- MP2 The student provides a response showing evidence of understanding that a function is a rule that assigns to each input exactly one output. _____
(MP2: Reason abstractly and quantitatively.)
- MP3 The student correctly recognizes that the data set in Part A does not represent a function and the data set in Part B does, and appropriately explains why the data sets in Part A or Part B fail to meet or meet the requirements of a function. _____
(MP3: Construct viable arguments and critique the reasoning of others.)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

Define, evaluate, and compare functions.

8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

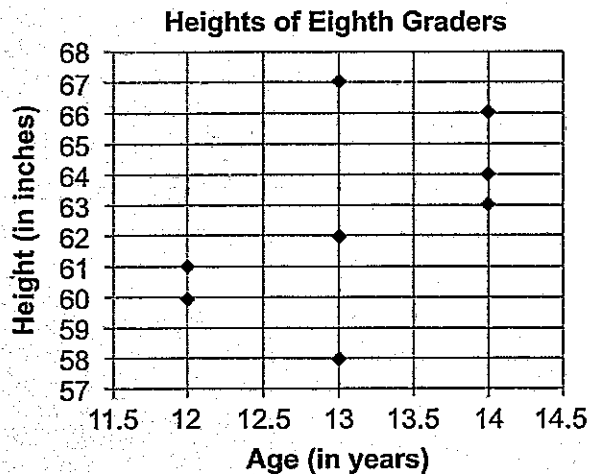
The CCSS for Mathematical Practice*

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

*Gray text indicates Mathematical Practices that are not addressed in this task.

Students' responses to a mathematical task provide evidence of what they understand and are able to do in relation to the standards and practices. Across tasks, this cumulative evidence shows students' understanding and abilities within a domain. When students do not respond completely to all parts of a task, they provide insufficient evidence of their mathematical understanding and abilities and therefore do not fully demonstrate the expectations of the standards and practices aligned with that task.

Task 3. Heights of 8th Graders Task



- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.


The graph is NOT a function since ~~1~~ x value has different y values. For example...

age	height
13	58
	62
	67

The graph can't be a function if one x value results in 2+ y values.

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in inches)	Age (in years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14

 yes, I agree with Leda that the table is a function. No x value has 2+ y values. Therefore, the table is a function.

Guide 1

Litho 12432

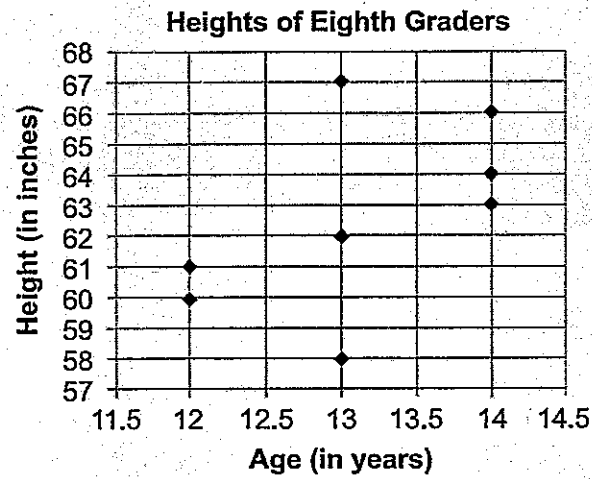
Total Content Points: 2 (8.F.1(a), 8.F.1(b))

Total Practice Points: 3 (MP1, MP2, MP3)

In this response, the student determines that the data in the graph is not a function and supports this assertion by creating a table showing one input (13) associated with multiple outputs (58, 62, 67) and by stating “the graph can’t be a function if one x value results in 2+ y values” (8.F.1(a)). The student correctly agrees with Leda in Part B that the new data set is a function since “no x value has 2+ y values” (8.F.1(b)). Both of these answers clearly provide evidence that the student recognizes a function as a rule that assigns to each input exactly one output (MP2). The student correctly determines if each data set meets the definition of a function (MP1) and constructs viable arguments why (MP3).

Total Awarded Points: 5 out of 5

Task 3. Heights of 8th Graders Task



- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.



I disagree,

because once you know their age, you can't determine what their height is.

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in inches)	Age (in years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14



I agree,
if you tell a person their
height you could come out
of what age you think
they are.

Guide 2

Litho 12375

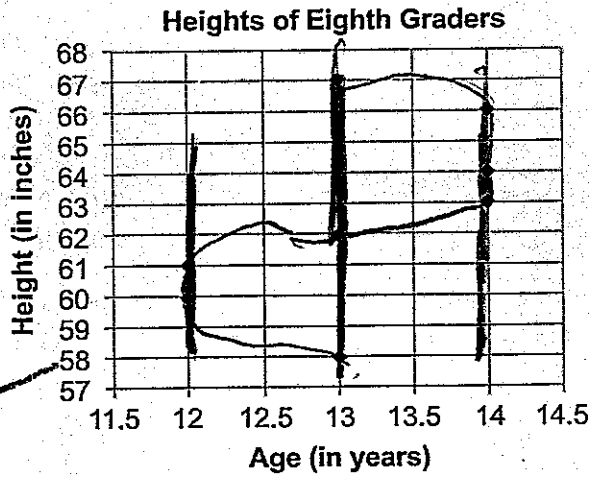
Total Content Points: 2 (8.F.1(a), 8.F.1(b))

Total Practice Points: 4 (MP1, MP2, MP3)


In this response, the student correctly disagrees with Delon and supports this answer by contextualizing the data: “because once you know their age, you can’t determine what their height is,” which is equivalent to stating that for each input (age) there is more than one output (height) (8.F.1(a)). The student correctly agrees with Leda in Part B by again contextualizing the data and indicating that if you knew a person’s height, then you would know their age (8.F.1(b)). Both of these answers provide evidence that the student recognizes a function as a rule that assigns to each input exactly one output (MP2). The student correctly determines if each data set meets the definition of a function and constructs viable arguments why (MP1, MP3).

Total Awarded Points: 5 out of 5

Task 3. Heights of 8th Graders Task




- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.

 I Disagree with Delon because on the graph you can draw a vertical line therefore, making it a non function.

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in. inches)	Age (in. years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14

 I agree because none of the X axis points are the same. Instead on this chart the y axis points are the same.

Guide 3

Litho 12401

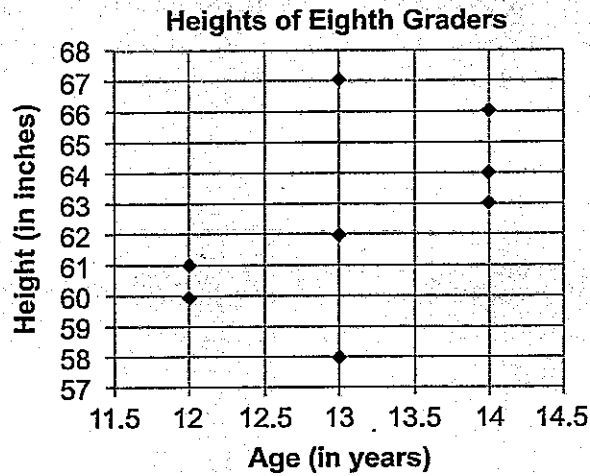
Total Content Points: 2 (8.F.1(a), 8.F.1(b))

Total Practice Points: 3 (MP1, MP2, MP3)


In this response, the student disagrees with Delon and states that the data does not represent a function “because on the graph you can draw a vertical line...” and illustrates this by drawing thick vertical lines through the multiple output values at each input value (8.F.1(a)). In Part B the student correctly agrees with Leda that the data does represent a function. The student states that “...none of the x axis points are the same. Instead...the y axis points are the same,” thereby recognizing that no two ordered pairs have different y -values for a single x -value (8.F.1(b)). Both of these answers provide evidence that the student recognizes a function as a rule that assigns to each input exactly one output (MP2). The student correctly determines if each data set meets the definition of a function (MP1) and constructs viable arguments why (MP3).

Total Awarded Points: 5 out of 5

Task 3. Heights of 8th Graders Task




- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.

 I Disagree because his points for the x is repeating.

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in inches)	Age (in years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14

 I agree because the x isn't repeating itself.

Guide 4

Litho 12387

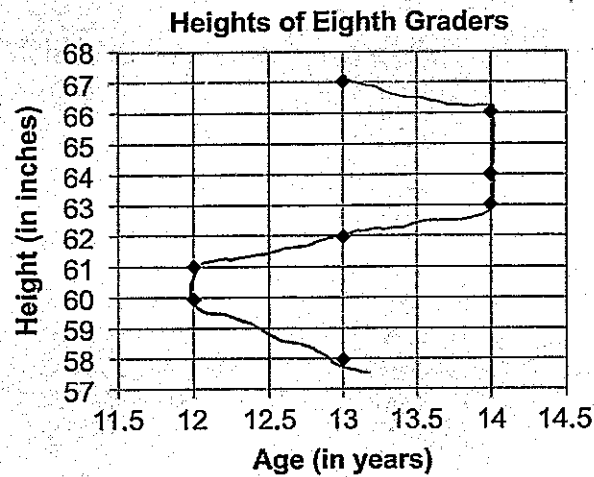
Total Content Points: 1 (8.F.1(a), 8.F.1(b))

Total Practice Points: 3 (MP1, MP2)


In this response, the student disagrees with Delon that the graph represents a function, indicating that the same x -values have more than one y -value by stating "...because his points for the x is repeating" (8.F.1(a)). In Part B, the student agrees that the new data set represents a function "...because the x isn't repeating itself," indicating that for any x -value there is only one y -value (8.F.1(b)). Both of these answers provide evidence that the student recognizes a function as a rule that assigns to each input exactly one output (MP2). The student correctly determines if each data set meets the definition of a function (MP1); however, the student's explanations need to be more clear and precise to be considered viable (no credit for MP3).

Total Awarded Points: 4 out of 5

Task 3. Heights of 8th Graders Task




- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.

 No because the line doesn't pass the vertical line test and the input is repeated

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in inches)	Age (in years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14

 Yes because the input is not repeated.

Guide 5

Litho 12399

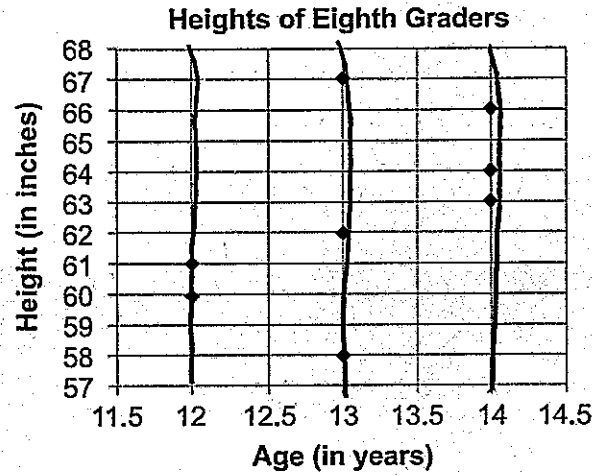
Total Content Points: 1 (8.F.1(a), 8.F.1(b))

Total Practice Points: 3 (MP1, MP2)


In this response, the student does not agree that the graph represents a function and reasons that "...the line doesn't pass the vertical line test..." A darkened vertical line is drawn at $x = 14$ through the points, illustrating that there is more than one y -value for that x -value (8.F.1(a)). In Part B, the student agrees that the new data set represents a function "...because the input isn't repeated," indicating that for any x -value, there is only one y -value (8.F.1(b)). Both of these answers provide evidence that the student recognizes a function as a rule that assigns to each input exactly one output (MP2). The student correctly determines if each data set meets the definition of a function (MP1); however, the explanations lack clarity (no credit for MP3).

Total Awarded Points: 4 out of 5

Task 3. Heights of 8th Graders Task




- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.

 NO, the line test says there can only be one point on each line. so, it is not a linear function.

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in inches)	Age (in years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14

 NO, there is one x-axis that makes one point different. And all of the y's have multiple times. so it can't be linear.

Guide 6

Litho 12362

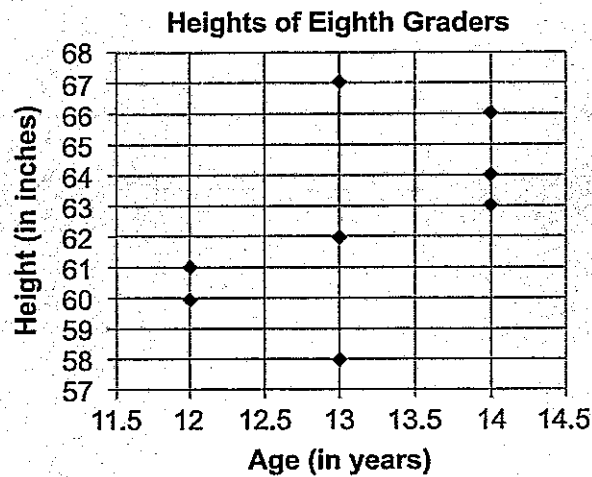
Total Content Points: 1 (8.F.1.(a))

Total Practice Points: 2 (MP2)


In this response, the student disagrees that the graph represents a function and reasons that "...the line test says there can only be one point on each line..." Furthermore, vertical lines are drawn at each x -value for which there is output, showing that there is more than one output value for each input (8.F.1(a)). This part of the response also provides evidence that a function is a rule that assigns to each input exactly one output (MP2). In Part B, the student does not agree that the new data set represents a function (no credit for 8.F.1(b)). By answering Part B incorrectly, the student does not determine if each data set meets the definition of a function (no credit for MP1). Also in Part B, the student fails to explain why the data set meets the requirements of a function (no credit for MP3).

Total Awarded Points: 2 out of 5

Task 3. Heights of 8th Graders Task



- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.

 No its not because there are too many people on one line. If they had were only one person on the line it would be a function but there is no way were you connect all the dots and it looks write.

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in inches)	Age (in years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14



No because the age should be on the left
and the height should be on the right.

Guide 7

Litho 12373

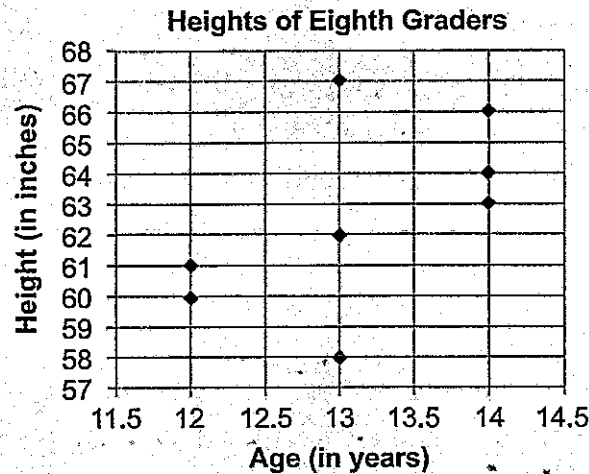
Total Content Points: 1 (8.F.1(a))

Total Practice Points: 1 (MP2)


In this response, the student says the data set does not represent a function "...because there are too many people on one line," indicating that there is more than one y -value for each x -value (8.F.1(a)). This answer also provides evidence that a function is a rule that assigns to each input exactly one output (MP2). The data set in Part B is incorrectly assessed as not representing a function (no credit for 8.F.1(b)). By answering Part B incorrectly, the student does not determine if each data set meets the definition of function (no credit for MP1). Also in Part B, the student fails to explain why the data set meets the requirements of a function (no credit for MP3).

Total Awarded Points: 2 out of 5

Task 3. Heights of 8th Graders Task



- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.



$60 = 12x$

$60 = 12x + B$

$\frac{60}{12} = \frac{12x}{12} + \frac{B}{12}$

$5 = x + \frac{B}{12}$

$5 - x = \frac{B}{12}$ → SLOPE

I disagree.

Whenever you set up the equation the way he places it, 60 as output and 12 as input, you have to solve to find your slope. Once you solve, you get the answer 5. After looking at the graph, and realizing there isn't any points plotted on the slope required, you can see that the graph does NOT represent a function.

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in inches)	Age [#] (in years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14

$$\frac{(60, 12) \quad 12 - 12}{(61, 12) \quad 61 - 60} = \frac{0}{1} \text{ undefined}$$

$$\frac{(58, 13) \quad 13 - 13}{(62, 13) \quad 62 - 58} = \frac{0}{4} \text{ undefined}$$

I DISAGREE

Because you've calculated the problems, ~~you~~ see that some, if not all, come out to be no solution. This means the slope is undefined and no equation can be made.

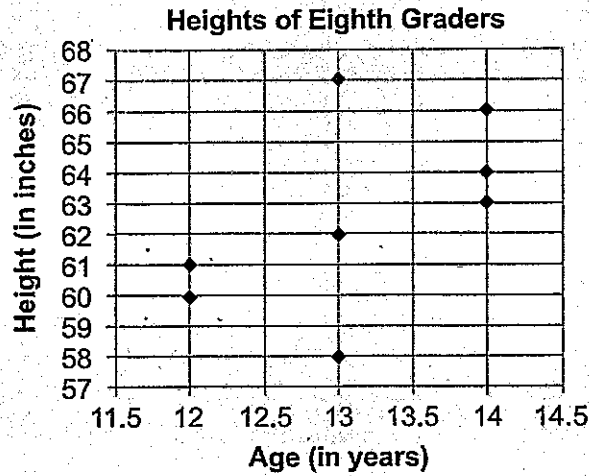
Total Content Points: 0

Total Practice Points: 0


In this response, the student correctly disagrees with Delon that the data set is a function, but the underlying reasoning (calculating a slope) indicates a lack of understanding of functions (no credit for 8.F.1(a)). The values in Part B are not recognized as a function (no credit for 8.F.1(b)). By answering Part B incorrectly, the student does not determine if each data set meets the definition of function (no credit for MP1). No part of the response shows evidence of the student understanding the rules of functions (no credit for MP2). This response does not suitably explain why either data set meets or does not meet the requirements of a function (no credit for MP3).

Total Awarded Points: 0 out of 5

Task 3. Heights of 8th Graders Task




- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.

 I disagree with it being a function, because 1. A function is a straight line and is supposed to always make 1 line. And looking at the chart there is 3 different straight lines.

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in inches)	Age (in years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14

 Height	Age	
+1 60	12	I disagree because height doesn't have same x-numbers at a constant change, and for the y-side it don't make sense to go small to big number. So its a non-linear function
+1 61	12	
-3 58	13	
+4 62	13	
+5 67	13+1	
+4 63	14	
+1 64	14	
+2 66	14	

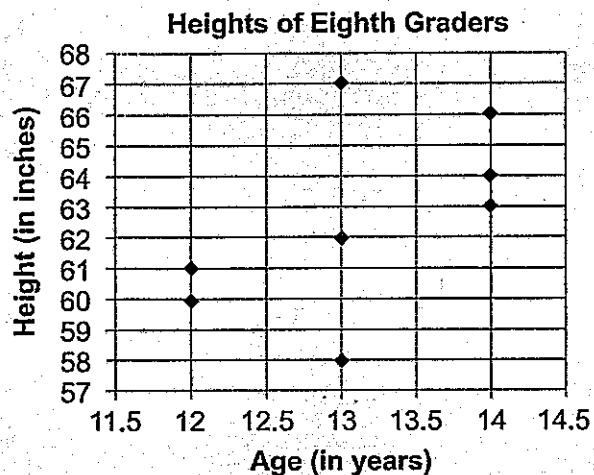
Total Content Points: 0

Total Practice Points: 0


In this response, the student correctly disagrees with Delon that the data set is a function, but the reasoning is incorrect and indicates a lack of understanding of functions (no credit for 8.F.1(a)). In Part B, the student disagrees that the new data set represents a function, and after some reasoning that indicates a lack of understanding of functions, concludes "...it's a non-linear function" (no credit for 8.F.1(b)). By answering Part B incorrectly, the student does not determine if each data set meets the definition of function (no credit for MP1). No part of the response shows evidence of the student understanding the rules of functions (no credit for MP2). This response does not suitably explain why either data set meets or does not meet the requirements of a function (no credit for MP3).

Total Awarded Points: 0 out of 5

Task 3. Heights of 8th Graders Task



- a. Delon says the graph shown above represents a function, with age as the input and height as the output. Explain why you agree or disagree with Delon.

 It's not a function as it is not linear and has no rate of change, slope or line.

- b. His math partner, Leda, decides to display the data differently, showing height as the input and age as the output. She says that this new data set represents a function. Explain why you agree or disagree with Leda.

Height (in inches)	Age (in years)
60	12
61	12
58	13
62	13
67	13
63	14
64	14
66	14



It is not a function because if represented as a graph it would not be a linear equation using the vertical line method.

Total Content Points: 0

Total Practice Points: 0

In this response, the student correctly disagrees with Delon that the data set is a function, but the reasoning is incorrect (no credit for 8.F.1(a)). The data set in Part B is incorrectly assessed as not representing a function (no credit for 8.F.1(b)). By answering Part B incorrectly, the student does not determine if each data set meets the definition of function (no credit for MP1). No part of the response shows evidence of the student understanding the rules of functions (no credit for MP2). This response does not suitably explain why either data set meets or does not meet the requirements of a function (no credit for MP3).

Total Awarded Points: 0 out of 5