

Algebra 1
Comparing Function Representations

Comparing Function Representations | A1-U04-P08

96 problems · Four activity formats

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Topic focus
Across 96 tasks this topic asks for coordinated function representation with justification and written qualitative graph description from the given process.
8 PDFs and a README; 57 buyer pages.

Algebra 1

Comparing Function Representations

Name: _____ Date: _____ Class: _____

Answer each question and record the matching bank letter. Give exact values. A value without its unit is not a complete answer.

A table lists boundary values $(-3, 10)$ and $(5, -6)$ for a line, plus an interior row $(1, 2)$. The domain is $-3 < x < 5$ except $x = 2$. Supply every open mark required.

Bank label: _____

List the ordered pairs for $s(x) = x^2 + 1$ when $x = -4, -2, 0, 3$, and 5 .

Bank label: _____

Data at $x = 0, 2$, and 5 give $3, 7$, and 13 . Two candidates, $2x + 3$ and $2|x| + 3$, both fit. A new row is $(-4, -5)$. What follows?

Bank label: _____

Every allowed input-output pair is $(-6, -9)$, $(-2, -1)$, $(3, 9)$, and $(8, 19)$. They are collinear. Decide graph form.

Input	Output
-6	-9
-2	-1
3	9
8	19

Bank label: _____

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Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. A value without its unit is not a complete answer.

For $f(x) = 3x - 4$, a table has output 8 in one blank row and output -10 in another. Recover both inputs. 	Functions $f(x) = \frac{2x+2}{x+1}$ and $g(x) = 2$ are both declared on all real x except -1. Is their equality established despite the hole? 																
A table gives $(-1, 0)$, $(0, 2)$, and $(2, 6)$. Test candidates $2x + 1$, $x + 2$, and $x^2 + 2$. Is any consistent with every row? <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 50%;">Input</th> <th style="width: 50%;">Output</th> </tr> </thead> <tbody> <tr> <td>-1</td> <td>0</td> </tr> <tr> <td>0</td> <td>2</td> </tr> <tr> <td>2</td> <td>6</td> </tr> </tbody> </table> 	Input	Output	-1	0	0	2	2	6	Data at $x = -1, 0, 1$ are $1, 0, 1$. A solution says these rows prove the unrestricted rule is x^2 rather than x. Diagnose the reasoning. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 50%;">Input</th> <th style="width: 50%;">Output</th> </tr> </thead> <tbody> <tr> <td>-1</td> <td>1</td> </tr> <tr> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> </tr> </tbody> </table> 	Input	Output	-1	1	0	0	1	1
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-1	0																
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0	0																
1	1																
For $F(x) = (x - 3)^2 - 5$, construct an ordered table at $x = -1, 1, 3, 6$, and 8. 	A table for $y = \frac{12}{x-1}$ has output -4 and a blank input. Its declared domain is $\{-5, -2, 0, 2, 4\}$. Recover the row and verify membership. 																

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Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: The valid table is $\{(-5, 0), (-4, 3), (-3, 4), (0, 5), (3, 4), (4, 3), (5, 0)\}$; $x = 1$ is excluded by the declared finite domain. Function A is $A(x) = 9 - x^2$ on $[-2, 3]$. Function B's complete table has highest output 8. Compare maximum values. Your response: _____	Incoming: A's maximum is 9 at $x = 0$, so A exceeds B's maximum 8 by 1. A partial table for $a(x) = x - 4$ omits the row at the graph's vertex input. Add it. Your response: _____
Incoming: The data select $y = -2x + 6$. A function follows $S(x) = \sqrt{25 - x^2}$ on the declared domain $\{-5, -4, -3, 0, 3, 4, 5\}$. A request also includes $x = 1$. Write the complete valid table and address $x = 1$. Your response: _____	Incoming: The missing inputs are $x = -7$ and $x = 3$, giving pairs $(-7, 5)$ and $(3, 5)$. A correct graph has points $(-2, 7)$, $(1, 4)$, and $(5, -3)$. A table sorts inputs as $-2, 1, 5$ but copies outputs in graph-reading order $-3, 4, 7$. Repair the table. Your response: _____
Incoming: Candidate A, $x^2 - 1$, is the only match; the row $x = 1$ gives 0 rather than 2 or 1. Two unknown real-domain functions both contain $(0, 1)$, $(1, 3)$, and $(2, 5)$. Is that enough to prove they are identical? Your response: _____	Incoming: The missing pair is $(4, 11)$. The formula $y = 5 - x$ is restricted to $-1 < x \leq 4$, but its graph uses a closed point at $(-1, 6)$ and an open point at $(4, 1)$. Repair the marks. Your response: _____

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Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

Complete the task, then compare the direct table approach with an equivalent check. Explain why both support the same conclusion. A table supplies $(0, 1)$, $(2, 5)$, $(5, 5)$, and $(7, 0)$, with straight-line travel specified between consecutive rows. Give the graph construction.

Input	Output
0	1
2	5
5	5
7	0

A table says time 2 minutes gives distance 9 meters. The graph plots the corresponding point as $(9, 2)$ while time is labeled horizontal. Diagnose it.

Comparing Function Representations

Full Worked Solutions - excerpt

Worked example

Problem. A table lists boundary values $(-3, 10)$ and $(5, -6)$ for a line, plus an interior row $(1, 2)$. The domain is $-3 < x < 5$ except $x = 2$. Supply every open mark required.

Answer. Place open boundary points at $(-3, 10)$ and $(5, -6)$, and an open hole at $(2, 0)$.

Explanation and check.

The rows determine $y = -2x + 4$; both strict bounds are open, and the removed input 2 locates the additional hole at output zero.

Worked example

Problem. List the ordered pairs for $s(x) = x^2 + 1$ when $x = -4, -2, 0, 3$, and 5 .

Answer. The square-plus-one table is $\{(-4, 17), (-2, 5), (0, 1), (3, 10), (5, 26)\}$.

Explanation and check.

Square each input first, then add one to obtain the five exact outputs.