

Algebra 1
Horizontal and Vertical Lines

Horizontal and Vertical Lines | A1-U05-P12

96 problems · Four activity formats

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Topic focus
Across 96 tasks this topic asks for an exact equation, graph description, membership set, or justified function conclusion.
8 PDFs and a README; 71 buyer pages.

Algebra 1

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Name: _____ Date: _____ Class: _____

Answer each question and record the matching bank letter. Give exact values. Give the whole requested response, including any reasoning the question asks for.

For $y = \frac{7}{4}$, complete $(?, \frac{7}{4})$ when the question mark is in the free-coordinate position. Describe all possible completions.

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. Give the whole requested response, including any reasoning the question asks for.

Test whether the complete point $(-\frac{7}{3}, \frac{8}{5})$ belongs to $x = -\frac{7}{3}$, stating which coordinate the equation actually checks. 	Test whether the complete point $(0, -17)$ belongs to $y = -17$, stating which coordinate the equation actually checks.
Consider $y = \frac{19}{5}$, restricted to the nondegenerate segment with the free coordinate from -10 through -2. Is this relation a function of x? State its exact domain and range and justify using fixed versus free coordinates. 	Test whether the complete point $(18, 0)$ belongs to $x = 18$, stating which coordinate the equation actually checks.
Every point in a line has y-coordinate 4, while the other coordinate is unrestricted. Write its equation and orientation. 	The y-axis is a vertical line containing $(0, 2)$ and the origin. Write its constant-coordinate equation.

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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.

A student says the horizontal line through $(4, -3)$ is $x = 4$. Identify the swapped coordinate and repair the equation.

Consider $x = 18$, restricted to the nondegenerate segment with the free coordinate from 1 through 9. Is this relation a function of x ? State its exact domain and range and justify using fixed versus free coordinates.

A student claims $(\frac{3}{2}, -4)$ cannot lie on $y = -4$ because its x -coordinate is fractional. Repair the membership reasoning.

Choose and justify a method before solving (identify the fixed coordinate, use point membership, or compare graph orientation). Then complete the task: Can any value replace the question mark in $(?, \frac{8}{3})$ to place the point on $y = -\frac{27}{11}$? Use the already displayed fixed-coordinate entry.

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Full Worked Solutions - excerpt

Worked example

Problem. For $y = \frac{7}{4}$, complete $(?, \frac{7}{4})$ when the question mark is in the free-coordinate position. Describe all possible completions.

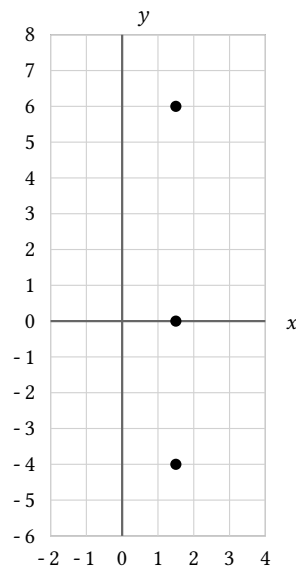
Answer. For $y = \frac{7}{4}$: Every point $(x, \frac{7}{4})$ lies on $y = \frac{7}{4}$; the missing x may be any real number.

Explanation and check.

The required coordinate already equals $\frac{7}{4}$. Every real value of the missing free coordinate therefore gives another member.

Worked example

Problem. Graph the exact fractional-coordinate line $x = \frac{3}{2}$ on a 1-unit grid without rounding. Give three points that keep the required coordinate fixed.



Answer. For $x = \frac{3}{2}$, plot $(\frac{3}{2}, -4)$, $(\frac{3}{2}, 0)$, and $(\frac{3}{2}, 6)$, then extend the vertical line up and down.

Explanation and check.

The fixed coordinate remains exactly $\frac{3}{2}$ even when it lies between integer grid labels; each listed pair satisfies $x = \frac{3}{2}$.