Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Writing Linear Equations from Two Points

Writing Linear Equations from Two Points | A1-U05-P11

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for an exact full function rule with required verification or conclusion.

8 PDFs and a README; 72 buyer pages.

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

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Algebra 1

Writing Linear Equations from Two Points

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.

Two exact observations are $(-2, 6), (5, 6)$. Determine the affine rule and explain what equal outputs imply.

Bank label: _____

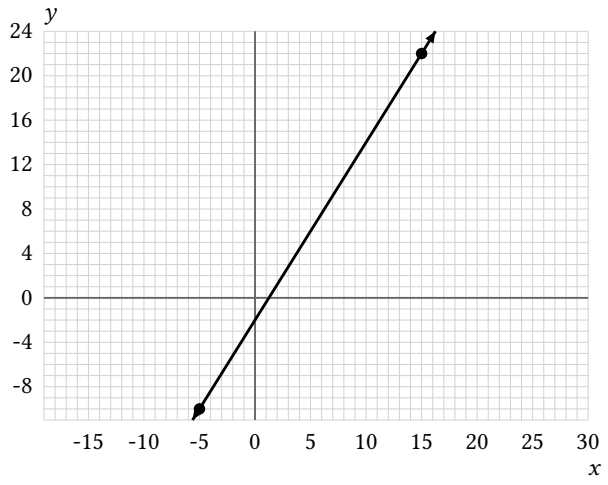
Recover the linear function through $(1, 3), (4, 0)$. Keep the subtraction order consistent when finding its negative slope.

Bank label: _____

The exact points $(0, 1), (3, 7)$ lie on one linear function. Derive the complete rule and verify the axis point.

Bank label: _____

A line graph supplies exact marked points $(-5, -10), (15, 22)$; each horizontal grid step is 1 unit(s) and each vertical grid step is 1 unit(s). Reconstruct $f(x) = mx + b$ and verify both marks.



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.

A table lists $(-6, 9), (3, 0)$, and $(12, -9)$. A student uses the first and third rows, gets slope -1, but writes $f(x) = -x - 3$. Locate the first failed verification.	Given the exact observations $(-5, 2), (-5, -7)$, determine whether they identify one linear function of x, no such function, or insufficient evidence. Justify, and for insufficient evidence give two contrasting rules.
Assume a linear relationship for the rental balance. At 3 days, the exact remaining prepaid balance is 144 dollars; at 6 days, it is 108 dollars. Let x be days from the stated zero reference. Infer the rate with units and derive the complete model.	Assume a linear relationship for the candle length. At 30 minutes, the exact length after lighting is 20 centimeters; at 36 minutes, it is $\frac{96}{5}$ centimeters. Let x be minutes from the stated zero reference. Infer the rate with units and derive the complete model.
Given the exact observations $(0, 2), (3, 8)$, determine whether they identify one linear function of x, no such function, or insufficient evidence. Justify, and for insufficient evidence give two contrasting rules.	Assume a linear relationship for the transit card. At 6 rides, the exact remaining value after rides is $\frac{67}{2}$ dollars; at 12 rides, it is 17 dollars. Let x be rides from the stated zero reference. Infer the rate with units and derive the complete model.

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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: $(-6, 3), (0, 1), (12, -4)$ admits no single linear rule; the first two imply $f(x) = -\frac{1}{3}x + 1$, but $(12, -4)$ does not satisfy it.

Assume a linear relationship for the delivery distance. At 45 minutes ($\frac{3}{4}$ hour), the exact signed position from the depot is 30 kilometers; at 405 minutes ($\frac{27}{4}$ hours), it is 318 kilometers. Let x be measured in hours from the stated zero reference. Convert the input measurements, infer the rate with units, and derive the complete model.

Your response: _____

Incoming: For the delivery distance, $Q(x) = 48x - 6$; rate 48 kilometers per hour, and $Q(0) = -6$ kilometers.

Assume a linear relationship for the data allowance. At 5 days, the exact unused data after the billing period starts is 22 gigabytes; at 11 days, it is $\frac{92}{5}$ gigabytes. Let x be days from the stated zero reference. Infer the rate with units and derive the complete model.

Your response: _____

Incoming: For the balloon altitude, $Q(x) = 18x - 40$; rate 18 meters per minute, and $Q(0) = -40$ meters.

Given the exact observations $(-6, 3), (0, 1), (12, -4)$, determine whether they identify one linear function of x, no such function, or insufficient evidence. Justify, and for insufficient evidence give two contrasting rules.

Input x	Output y
-6	3
0	1
12	-4

Your response: _____

Incoming: The trusted rows give $f(x) = 2x + 3$; after verification, the missing row is $(7, 17)$.

Trusted exact rows are $x = -4$, $f(x) = -8$; $x = 2$, $f(x) = 1$, and the output at $x = 8$ is missing. First derive and state the unique complete linear function, verify every trusted row, and only then repair the labeled record.

Input x	Output y
-4	-8
2	1

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.

From points $(1, 4)$ and $(4, 10)$, a student says the slope is 6 because $10 - 4 = 6$, then writes $f(x) = 6x - 2$. Find the first invalid inference and correct the rule.

On a graph, each horizontal grid step is 2 units and each vertical step is 5 units. A student counts a rise of 3 squares over 4 squares and reports slope $\frac{3}{4}$. Correct the scale error.

A student fits $(1, 4)$ and $(5, 12)$ with $f(x) = 2x + 2$, then claims the additional exact point $(9, 21)$ confirms linearity because it is close. Audit the conclusion.

A student uses points $(-2, 7)$ and $(3, -3)$, computes $\frac{-3-7}{3-(-2)} = -2$, and writes $f(x) = -2x + 7$. Audit the intercept.

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Full Worked Solutions - excerpt

Worked example

Problem. Two exact observations are $(-2, 6), (5, 6)$. Determine the affine rule and explain what equal outputs imply.

Answer. For points $(-2, 6), (5, 6)$, $f(x) = 6$.

Explanation and check.

The rate is $\frac{(6)-(6)}{(5)-(-2)} = 0$. Substitution gives $f(0) = 6$, so $f(x) = 6$; both points satisfy it.

Worked example

Problem. Recover the linear function through $(1, 3), (4, 0)$. Keep the subtraction order consistent when finding its negative slope.

Answer. For points $(1, 3), (4, 0)$, $f(x) = -x + 4$.

Explanation and check.

The rate is $\frac{(0)-(3)}{(4)-(1)} = -1$. Substitution gives $f(0) = 4$, so $f(x) = -x + 4$; both points satisfy it.