

Algebra 1
Writing & Converting Linear Equations | Algebra 1 | 5-Topic Bundle

5-topic bundle | 480 problems | Four activity formats

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View individual product and its full preview
-

In every topic

Answer Bank Challenge	24 tasks
Grid Rounds	24 tasks
Match & Move	24 cards
Error Analysis & Strategy	24 tasks
Quick Answer Key and Full Worked Solutions	included
Teacher / Parent Use Guide and Terms of Use	included

Product previews

The following preview pages show the cover, all four activity formats, and worked examples for each included resource, in the listed order.

40 PDFs and 5 READMEs; 275 buyer PDF pages across the 5 products.

Preview pages are not included in the buyer page count. Check the list against resources you already own.

Algebra 1
Writing Slope-Intercept Equations

Writing Slope-Intercept Equations | A1-U05-P07
96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
03	Match & Move	24 cards
04	Error Analysis & Strategy	24 tasks
05	Quick Answer Key	96 answers
06	Full Worked Solutions	96 solutions
07	Teacher / Parent Use Guide	included
08	Terms of Use & License	included

Topic focus
Across 96 tasks this topic asks for an exact slope-intercept equation or justified family verdict.
8 PDFs and a README; 47 buyer pages.

Algebra 1

Writing Slope-Intercept Equations

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.

A line has slope 0 and vertical intercept 9. Encode the horizontal line in slope-intercept form. _____ Bank label: _____	A line has slope 0 and vertical intercept -5. Encode the horizontal line in slope-intercept form. _____ Bank label: _____
A line has slope 0 and vertical intercept 0. Encode the horizontal line in slope-intercept form. _____ Bank label: _____	For $m = -2$ through $(3, 1)$, a student records $b = 1 - 2(3) = -5$. Is subtracting $2(3)$ valid here? State the sign error and the correct value of b. _____ Bank label: _____
A line is specified by slope 6 and vertical-intercept value 3. Write its equation with signs simplified. _____ Bank label: _____	A line has $m = \frac{2}{5}$ through $(5, 4)$. Work uses $\frac{5}{2}$ in $y = mx + b$ and obtains $b = -\frac{17}{2}$. Repair it. _____ Bank label: _____
With slope -3 and x-intercept $(4, 0)$, a student writes $b = 4$. Correct the roles. _____ Bank label: _____	Write the slope-intercept rule for the line with slope -2 through $(3, 1)$. Preserve signs when solving for b. _____ Bank label: _____

Algebra 1

Writing Slope-Intercept Equations

Name: _____ Date: _____ Class: _____

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.

The required line has slope 2 and passes through $(1, 3)$. A student proposes $y = 2x + 1$. Verify both slope and point membership, repairing it if needed. 	Slope 2 and point $(3, 7)$ are given. A student sets $b = 7$ and writes $y = 2x + 7$. Diagnose the intercept mistake.
The required line has slope -3 and passes through $(2, 1)$. A student proposes $y = -3x + 4$. Verify both slope and point membership, repairing it if needed. 	For slope -1 through $(2, 5)$, work substitutes $x = 5, y = 2$ and gets $b = 7$. Repair the coordinate use.
The slope is 0 and the line contains $(0, -2)$. Recover b and write the horizontal equation. 	A line has supplied slope 1 and contains the y-axis point $(0, 7)$. Write its slope-intercept equation.

Algebra 1

Writing Slope-Intercept Equations

Name: _____ Date: _____ Class: _____

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.

The required line has slope $-\frac{2}{3}$ and passes through $(3, 1)$. A student proposes $y = -x + 3$. Verify both slope and point membership, repairing it if needed.

Choose and justify an efficient method, then complete the task. The facts are: the line contains $(0, 4)$ and $b = 4$. Do they determine m ?

Complete the task, then compare two valid approaches or representations and justify which is clearer for the supplied information. The required line has slope 3 and passes through $(-2, 4)$. A student proposes $y = 3x - 2$. Verify both slope and point membership, repairing it if needed.

Complete the task, then compare two valid approaches or representations and justify which is clearer for the supplied information. The required line has slope $\frac{5}{4}$ and passes through $(4, 3)$. A student proposes $y = (\frac{5}{4})x$. Verify both slope and point membership, repairing it if needed.

Writing Slope-Intercept Equations

Full Worked Solutions - excerpt

Worked example

Problem. A line has slope 0 and vertical intercept 9. Encode the horizontal line in slope-intercept form.

Answer. The slope-intercept equation is $y = 9$.

Explanation and check.

Insert $m = 0$ as the x coefficient and $b = 9$ as the constant; this gives $y = 9$.

Worked example

Problem. A line has slope 0 and vertical intercept -5 . Encode the horizontal line in slope-intercept form.

Answer. The slope-intercept equation is $y = -5$.

Explanation and check.

Insert $m = 0$ as the x coefficient and $b = -5$ as the constant; this gives $y = -5$.

Algebra 1
Point-Slope Form

Point-Slope Form of a Linear Equation | A1-U05-P08

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
03	Match & Move	24 cards
04	Error Analysis & Strategy	24 tasks
05	Quick Answer Key	96 answers
06	Full Worked Solutions	96 solutions
07	Teacher / Parent Use Guide	included
08	Terms of Use & License	included

Topic focus
Across 96 tasks this topic asks for an exact anchored equation, graph, or justified representation verdict.
8 PDFs and a README; 54 buyer pages.

Algebra 1

Point-Slope Form

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.

The line is $y + 3 = (3)(x + 1)$. Test whether $(0, 0)$ can serve as an alternate anchor; if it can, write the equivalent point-slope form. _____ Bank label: _____	Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Interpret the point-slope equation $y - 2 = -(x - 6)$. State its encoded anchor point and slope, explaining every plus sign inside a difference. _____ Bank label: _____
The line is $y + 4 = -(x - 4)$. Test whether $(0, 0)$ can serve as an alternate anchor; if it can, write the equivalent point-slope form. _____ Bank label: _____	Complete the task, then compare the direct formula approach with an equivalent check. Explain why both support the same conclusion. Interpret the point-slope equation $y - 9 = 0(x - 4)$. State its encoded anchor point and slope, explaining every plus sign inside a difference. _____ Bank label: _____
Interpret the point-slope equation $y + 2 = (-5)(x - 3)$. State its encoded anchor point and slope, explaining every plus sign inside a difference. _____ Bank label: _____	The line is $y - 1 = (4)(x - 2)$. Test whether $(5, 13)$ can serve as an alternate anchor; if it can, write the equivalent point-slope form. _____ Bank label: _____
Interpret the point-slope equation $y - 8 = (6)(x + 1)$. State its encoded anchor point and slope, explaining every plus sign inside a difference. _____ Bank label: _____	Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. The line is $y - 5 = (-2)(x - 3)$. Test whether $(-1, 13)$ can serve as an alternate anchor; if it can, write the equivalent point-slope form. _____ Bank label: _____

Algebra 1**Point-Slope Form****Name:** _____ **Date:** _____ **Class:** _____

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.

Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Interpret the point-slope equation $y - 5 = (2)(x - 3)$. State its encoded anchor point and slope, explaining every plus sign inside a difference.

Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Points $(3, -2)$ and $(3, 5)$ are vertical. Explain why finite- m point-slope form fails and give the valid equation.

Point-Slope Form

Full Worked Solutions - excerpt

Worked example

Problem. The line is $y + 3 = (3)(x + 1)$. Test whether $(0, 0)$ can serve as an alternate anchor; if it can, write the equivalent point-slope form.

Answer. Yes. The point lies on the line, and an equivalent anchored equation is $y = (3)(x)$.

Explanation and check.

The displacement from the original anchor has ratio

$$\frac{3}{1} = 3$$

retain the slope and recenter both differences.

Worked example

Problem. Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Interpret the point-slope equation $y - 2 = -(x - 6)$. State its encoded anchor point and slope, explaining every plus sign inside a difference.

Answer. The equation $y - 2 = -(x - 6)$ encodes anchor $(6, 2)$ and slope -1 .

Explanation and check.

Use the given symbolic relation directly, simplify exactly, and verify the result in the original relation. Match the form to $y - y_0 = m(x - x_0)$: the differences identify $(6, 2)$, and the direction parameter is -1 .

Algebra 1
Standard Form Linear Equations

Intercepts of Linear Equations in Standard Form | A1-U05-P09
96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
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Topic focus
Across 96 tasks this topic asks for exact standard-form data, points, graph, or justified validity conclusion.
8 PDFs and a README; 54 buyer pages.

Algebra 1

Standard Form Linear Equations

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.

Determine every x- and y-axis intersection of $2x + 3y = 12$. Distinguish unique points, no intersection, and an entire coincident axis. _____ Bank label: _____	Complete the partial point $(x, 1)$ for $3x + 2y = 11$, or explain any ambiguity caused by a zero coefficient. _____ Bank label: _____
Determine every x- and y-axis intersection of $x - y = 5$. Distinguish unique points, no intersection, and an entire coincident axis. _____ Bank label: _____	Normalize $-12y = 20$ to coprime integer standard form, using the convention that the first nonzero coefficient among A and B is positive. _____ Bank label: _____
Normalize $-18x = -3$ to coprime integer standard form, using the convention that the first nonzero coefficient among A and B is positive. _____ Bank label: _____	Normalize $10x - 80y = 30$ to coprime integer standard form, using the convention that the first nonzero coefficient among A and B is positive. _____ Bank label: _____
Normalize $30x + 75y = 105$ to coprime integer standard form, using the convention that the first nonzero coefficient among A and B is positive. _____ Bank label: _____	Normalize $27x + 12y = -6$ to coprime integer standard form, using the convention that the first nonzero coefficient among A and B is positive. _____ Bank label: _____

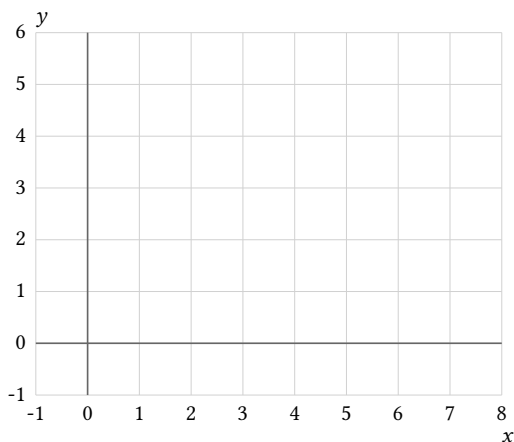
Algebra 1

Standard Form Linear Equations

Name: _____ Date: _____ Class: _____

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.

Graph $2x + 3y = 12$ while keeping standard form central. Choose two exact distinct points, handling any coincident intercepts or zero coefficient.



Normalize $4x + 6y = 12$ to coprime integer standard form, using the convention that the first nonzero coefficient among A and B is positive.

Normalize $3x - 12y = 15$ to coprime integer standard form, using the convention that the first nonzero coefficient among A and B is positive.

Check whether the full point $(3, 2)$ satisfies $2x + 3y = 12$ by using the implicit relation directly.

Algebra 1

**Standard Form
Linear Equations**

Name: _____ Date: _____ Class: _____

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 divides $6x + 9y = 15$ by 3 but writes $2x + 3y = 15$. Repair the normalization.

Choose and justify an efficient method, then complete the task. A supplied constraint is $20p + 15w = 600$. In its stated setting, interpret A , B , and C with units and describe one fixed-total tradeoff: pledge p contributes \$20, walk-in gift w contributes \$15, and the target is \$600.

Choose and justify an efficient method, then complete the task. A supplied constraint is $3x - 2y = 18$. In its stated setting, interpret A , B , and C with units and describe one fixed-total tradeoff: x contributes +3 units per unit, y contributes -2 units per unit, and the signed total is 18.

A response calls $0x + 0y = 7$ a horizontal line at $y = 7$. Audit the claim.

Standard Form Linear Equations

Full Worked Solutions - excerpt

Worked example

Problem. Determine every x - and y -axis intersection of $2x + 3y = 12$. Distinguish unique points, no intersection, and an entire coincident axis.

Answer. For $2x + 3y = 12$, the x -intercept is $(6, 0)$ and the y -intercept is $(0, 4)$.

Explanation and check.

Set $y = 0$ to solve $Ax = C$, and set $x = 0$ to solve $By = C$; check whether the resulting points coincide.

Worked example

Problem. Complete the partial point $(x, 1)$ for $3x + 2y = 11$, or explain any ambiguity caused by a zero coefficient.

Answer. The missing coordinate is $x = 3$, giving point $(3, 1)$.

Explanation and check.

Substitute $y = 1$ and solve $3x = 9$.

Algebra 1
Converting Forms of Linear Equations

Converting Forms of Linear Equations | A1-U05-P10

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
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08	Terms of Use & License	included

Topic focus
Across 96 tasks this topic asks for an exact equation or a justified equivalence conclusion.
8 PDFs and a README; 48 buyer pages.

Algebra 1

Converting Forms of Linear Equations

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.

Do $y + 1 = \frac{1}{2}(x - 6)$ and $y = \frac{1}{2}x - 4$ describe the same entire line? Justify by a reversible conversion or by comparing every scaled coefficient. _____ Bank label: _____	Clear the fractional coefficient in $y = -\frac{3}{7}x + 4$ and report the primitive integer standard equation. _____ Bank label: _____
Do $4x - 2y = 8$ and $2x - y = 4$ describe the same entire line? Justify by a reversible conversion or by comparing every scaled coefficient. _____ Bank label: _____	Expand $y + 5 = -\frac{7}{4}(x + 4)$ and simplify the anchor contribution before giving $y = mx + b$. _____ Bank label: _____
Do $2x + 3y = 12$ and $y = -\frac{2}{3}x + 4$ describe the same entire line? Justify by a reversible conversion or by comparing every scaled coefficient. _____ Bank label: _____	Clear the fractional coefficient in $y = -\frac{5}{3}x + 8$ and report the primitive integer standard equation. _____ Bank label: _____
Do $y - 5 = 2(x - 1)$ and $y = 2x + 3$ describe the same entire line? Justify by a reversible conversion or by comparing every scaled coefficient. _____ Bank label: _____	Expand $y - 6 = \frac{3}{5}(x + 5)$ and simplify the anchor contribution before giving $y = mx + b$. _____ Bank label: _____

Algebra 1

Converting Forms of Linear Equations

Name: _____ Date: _____ Class: _____

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.

Rewrite $y + 6 = \frac{5}{2}(x + 4)$ in slope-intercept form and handle both anchor signs explicitly. 	The line is given by $4x + 7y = 280$. You need to interpret the two per-item weights in a fixed-total constraint. Which form—slope-intercept, point-slope, or standard—best organizes this work, and why?
For the known line $y = 2x + 3$, Use the y-intercept as the anchor. Verify the point and write the corresponding point-slope equation. 	The line is given by $3x + 2y = 12$. You need to read the slope and y-intercept before graphing. Which form—slope-intercept, point-slope, or standard—best organizes this work, and why?
Change $y + 5 = -\frac{7}{2}(x - 2)$ to $y = mx + b$ without replacing any fraction by a decimal. 	Do $-6x + 9y = 15$ and $2x - 3y = 5$ describe the same entire line? Justify by a reversible conversion or by comparing every scaled coefficient.

Algebra 1

Converting Forms of Linear Equations

Name: _____ Date: _____ Class: _____

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: From $6x + 3y = -9$: $y = -2x - 3$. For the known line $3x - y = 6$, Use the point on the line whose x-coordinate is -1. Verify the point and write the corresponding point-slope equation. Your response: _____	Incoming: From $3x - y = 6$, use $(-1, -9)$: $y + 9 = 3(x + 1)$. Convert $y + 9 = 0(x - 8)$ to slope-intercept form and identify what the zero multiplier does. Your response: _____
Incoming: From $y = -3x + 5$: $3x + y = 5$. Convert $6x + 3y = -9$ to $y = mx + b$ and simplify both resulting coefficients. Your response: _____	Incoming: From $-5y = 15$: $y = 0x - 3$. Clear the fractional coefficient in $y = \frac{3}{4}x - 2$ and report the primitive integer standard equation. Your response: _____
Incoming: From $5x + 2y = 10$, use $(0, 5)$: $y - 5 = -\frac{5}{2}(x)$. Rewrite $9x - 6y = 18$ as $y = mx + b$, tracking the sign introduced when y is isolated. Your response: _____	Incoming: From $y - 3 = 2(x - 1)$: $y = 2x + 1$. Convert $4x + 2y = 10$ to $y = mx + b$ and simplify both resulting coefficients. Your response: _____

Algebra 1

Converting Forms of Linear Equations

Name: _____ Date: _____ Class: _____

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 converts $2x + 3y = 12$: $3y = -2x + 12$, then $y = -\frac{2}{3}x + 12$. Identify the first invalid step and repair the result.

A student claims $4x = 20$ becomes $y = 4x - 20$ after solving for y . Identify the structural mistake.

A student uses $(2, 5)$ to rewrite $y = 2x + 3$ as $y - 5 = 2(x - 2)$. Is the conversion valid? Diagnose it exactly.

A student changes $y + 4 = 3(x + 2)$ to $y = 3x + 10$. Diagnose the constant error and give the equivalent slope-intercept form.

Converting Forms of Linear Equations

Full Worked Solutions - excerpt

Worked example

Problem. Do $y + 1 = \frac{1}{2}(x - 6)$ and $y = \frac{1}{2}x - 4$ describe the same entire line? Justify by a reversible conversion or by comparing every scaled coefficient.

Answer. $y + 1 = \frac{1}{2}(x - 6)$ versus $y = \frac{1}{2}x - 4$: the same line; expansion combines -3 and -1 .

Explanation and check.

Put both equations in one form and compare the full solution sets. Since expansion combines -3 and -1 , they are the same line.

Worked example

Problem. Clear the fractional coefficient in $y = -\frac{3}{7}x + 4$ and report the primitive integer standard equation.

Answer. From $y = -\frac{3}{7}x + 4$: $3x + 7y = 28$.

Explanation and check.

Move the x -term to the left and scale the whole equation together; primitive sign normalization gives $3x + 7y = 28$.

Algebra 1

Writing Linear Equations from Two Points

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

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
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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.

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: _____

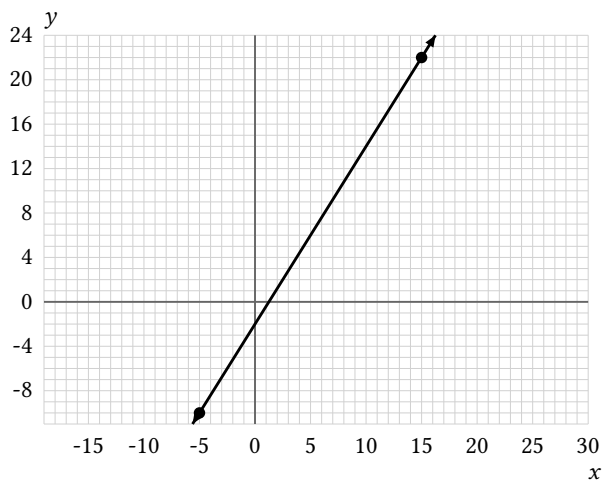
Recover the linear function through $(1, 3)$, $(4, 0)$. Keep the subtraction order consistent when finding its negative slope.

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: _____

Algebra 1

Writing Linear Equations from Two Points

Name: _____ Date: _____ Class: _____

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.

Algebra 1

Writing Linear Equations
from Two Points

Name: _____ Date: _____ Class: _____

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 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: 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: 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: _____

Algebra 1

Writing Linear Equations from Two Points

Name: _____ Date: _____ Class: _____

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.

Writing Linear Equations from Two Points

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.