

Algebra 1
Linear Functions: Current Collection | Algebra 1 | 17-Topic Bundle

17-topic bundle | 1,632 problems | Four activity formats

Included topics

The following pages list all 17 included resources in the suggested order, with a link to each product. Each resource retains its complete 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.

136 PDFs and 17 READMEs; 1,089 buyer PDF pages across the 17 products.

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

This is a fixed collection of the listed products. Purchase includes the existing individual resource files. To open a product's online preview, follow its title link and select View Preview.

Sets & Steps

Math Practice & Worked Solutions

Algebra 1

Included topics

17-topic bundle | 1,632 problems | Four activity formats

01 Average Rate of Change in Context

[View individual product and its full preview](#)

02 Slope from Two Points

[View individual product and its full preview](#)

03 Slope from Tables and Graphs

[View individual product and its full preview](#)

04 Positive, Negative, Zero, and Undefined Slope

[View individual product and its full preview](#)

05 Interpreting Slope-Intercept Form

[View individual product and its full preview](#)

06 Graphing Slope-Intercept Form

[View individual product and its full preview](#)

07 Writing Slope-Intercept Equations

[View individual product and its full preview](#)

08 Point-Slope Form

[View individual product and its full preview](#)

09 Standard Form Linear Equations

[View individual product and its full preview](#)

10 Converting Forms of Linear Equations

[View individual product and its full preview](#)

11 Writing Linear Equations from Two Points

[View individual product and its full preview](#)

17 included resources | Complete resource previews follow this guide.

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Sets & Steps

Math Practice & Worked Solutions

Algebra 1

Included topics

17-topic bundle | 1,632 problems | Four activity formats

12 Horizontal and Vertical Lines

[View individual product and its full preview](#)

13 Perpendicular Lines

[View individual product and its full preview](#)

14 Direct Variation

[View individual product and its full preview](#)

15 Linear Models from Initial Value and Rate

[View individual product and its full preview](#)

16 Evaluating Linear Models in Context

[View individual product and its full preview](#)

17 Transformations of Linear Functions

[View individual product and its full preview](#)

17 included resources | Complete resource previews follow this guide.

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Algebra 1
Average Rate of Change in Context

Average Rate of Change in Context | A1-U05-P01
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 a rate, comparison, interpretation, or justified conclusion with units.
8 PDFs and a README; 47 buyer pages.

Algebra 1

Average Rate of Change in Context

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 print shop quotes a variable cost rate of 4 cents per page. What changes, and by how much, when the page count rises by one? _____ Bank label: _____	Pump A fills at 3 liters per minute; pump B fills at 150 liters per hour. Which pump has the greater fill rate? _____ Bank label: _____
A connected graph passes through (0, 1), (2, 7), and (5, 16) with straight segments. Is the output rate constant from $x = 0$ to $x = 5$? _____ Bank label: _____	Battery charge is 93% at hour 2 and 69% at hour 8. Find its average rate in percentage points per hour. _____ Bank label: _____
One graph segment runs from (2, 9) to (8, 9); another runs from (−3, 1) to (1, 3). Compare average rates. _____ Bank label: _____	A concentration changes steadily at $-\frac{7}{4}(\frac{mg}{L})$ per hour for 12 hours. Find ΔC. _____ Bank label: _____
The number of people inside a hall is changing at +25 people per minute. Interpret the plus sign and the rate unit. _____ Bank label: _____	Printer R produces 5 pages per minute. Printer S produces 280 pages per hour. Which output rate is greater? _____ Bank label: _____

Algebra 1

Average Rate of
Change in Context

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 reservoir's water depth changes at -3 centimeters per day. What does this signed rate say about the depth? 	Temperature changes constantly at -3 °C per hour for 6 hours. What is the total temperature change?
A trail profile has a rate of change of $\frac{3}{4}$ meter of elevation per horizontal meter. Explain this rate without using the word slope. 	A cart moves at a constant 8 miles per hour for $\frac{3}{2}$ hours. How much does its traveled distance change?
Snow depth is increasing at 2 inches per hour. Translate the rate into an input-output statement. 	A robot's signed position changes at $12\frac{m}{s}$ for $\frac{5}{4}$ seconds. Compute Δx.

Algebra 1

Average Rate of Change in Context

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 says, 'Reading 12 pages in 3 minutes means the rate is 12 pages.' Diagnose and correct the statement.

A calculation uses output values 2 and 8 at input values 1 and 5, then reports $\frac{2}{3}$ input units per output unit. Find the error.

A hiker is 2 km from camp at both noon and 2 p.m. A student concludes the hiker's distance never changed. Audit the conclusion.

A value rises from 14 to 38 between hour 3 and hour 9. A student computes $\frac{38-14}{9}$. Diagnose the denominator.

Average Rate of Change in Context

Full Worked Solutions - excerpt

Worked example

Problem. A print shop quotes a variable cost rate of 4 cents per page. What changes, and by how much, when the page count rises by one?

Answer. The cost increases by 4 cents when the order gains one page.

Explanation and check.

The output is cost and the input is pages, so one page adds four cents.

Worked example

Problem. Pump A fills at 3 liters per minute; pump B fills at 150 liters per hour. Which pump has the greater fill rate?

Answer. Pump A; $3L/\text{min} = 180\frac{L}{h}$, which is greater than $150\frac{L}{h}$.

Explanation and check.

Convert the denominator unit: 3 liters each minute corresponds to

$$3 \times 60 = 180$$

liters each hour.

Algebra 1
Slope from Two Points

Slope from Two Points | A1-U05-P02
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, coordinate, construction, comparison, or justified conclusion.
8 PDFs and a README; 46 buyer pages.

Algebra 1

Slope 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.

Use the two coordinates $(-4, -3)$ and $(2, 3)$ to calculate m. Bank label: _____	Evaluate the difference ratio for $(0, -2)$ and $(6, 1)$. Bank label: _____
A report labels the slope through $(-4, 6)$, $(9, 6)$ undefined. Diagnose the confusion. Bank label: _____	Using the points in the listed order, find the slope from $(5, 2)$ to $(1, 10)$. Bank label: _____
Show with exact differences that reversing $(4, -1)$, $(-2, 8)$ does not change the slope. Bank label: _____	Compute the slope joining $(7, -3)$ to $(9, 3)$. Bank label: _____
A student uses $\frac{2-11}{15-3}$, then swaps the points. What ratio must the student use to keep the slope unchanged? Bank label: _____	Find the slope of the distinct points $(-6, 8)$, $(9, 8)$. Bank label: _____

Algebra 1

Slope 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: $x = -19$. A point $(x, 2)$ has slope $\frac{5}{8}$ with $(1, -3)$. Determine x. Your response: _____	Incoming: $x = 9$. Identify all equal slope outcomes among pairs A, B, and C, where A and B have repeated x-coordinates. $A: (-2, 1), (-2, 9)$; $B: (6, -5), (6, 4)$; $C: (0, 0), (1, 8)$ Your response: _____
Incoming: One pair is $(0, -5)$ and $(2, 0)$. Find x in $(x, 11)$ when the slope to $(-1, -1)$ is $-\frac{2}{3}$. Your response: _____	Incoming: For $(-4, -7)$ and $(5, -5)$, the slope is $\frac{2}{9}$. Compute the slope from $(-9, 3)$ to $(-5, 14)$. Your response: _____
Incoming: $y = 8$. Which signed slope is greater: A through $(0, 0), (5, -4)$ or B through $(2, 7), (9, 1)$? Your response: _____	Incoming: $x = 2$. If $(5, -1)$ and $(9, y)$ have slope $-\frac{3}{4}$, find the missing output coordinate. Your response: _____

Algebra 1

**Slope 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.

For points $(1, 2)$ and $(5, 10)$, a student writes $\frac{10-2}{1-5} = -2$. Diagnose and repair the calculation.

A solution for $(-2, 1), (4, 10)$ computes run over rise and reports $\frac{2}{3}$. Correct it.

Pairs A and B start at $(0, 0)$ and end at $(4, 4)$ and $(4, -4)$. Compare their signed slopes and magnitudes.

A student calls the slope through $(3, -5), (3, 8)$ zero because the x -values match. What is the correct conclusion?

Slope from Two Points

Full Worked Solutions - excerpt

Worked example

Problem. Use the two coordinates $(-4, -3)$ and $(2, 3)$ to calculate m .

Answer. For $(-4, -3)$ and $(2, 3)$, the slope is 1.

Explanation and check.

Rise and run are both 6, hence $m = \frac{6}{6} = 1$.

Worked example

Problem. Evaluate the difference ratio for $(0, -2)$ and $(6, 1)$.

Answer. For $(0, -2)$ and $(6, 1)$, the slope is $\frac{1}{2}$.

Explanation and check.

The ratio of changes is $\frac{1-(-2)}{6-0} = \frac{3}{6} = \frac{1}{2}$.

Algebra 1
Slope from Tables and Graphs

Slope from Tables and Graphs | A1-U05-P03

96 problems · Four activity formats

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

Topic focus
Across 96 tasks this topic asks for an exact slope, missing datum, comparison, or justified linearity conclusion.
8 PDFs and a README; 87 buyer pages.

Algebra 1

Slope from Tables and Graphs

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 graphs show the same square angle but use different horizontal units. Graph A: 4 squares right, 2 squares up; each horizontal square is 1x-units and each vertical square is 1y-units. Graph B: 4 squares right, 2 squares up; each horizontal square is 2x-units and each vertical square is 1y-units. Compare their signed coordinate slopes.

An interior output must share the common rate. The table $x = -3, y = 2; x = 1, y = ?; x = 5, y = 10$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

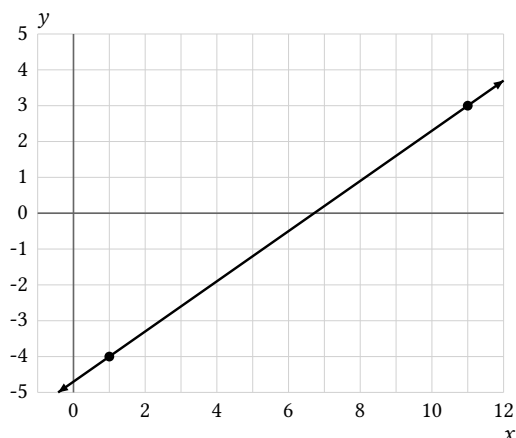
The table is declared linear.

Input x	Output y
-3	2
1	_____
5	10

Bank label: _____

Bank label: _____

An exact line graph marks the points $x = 1, y = -4; x = 11, y = 3$. Determine its slope.



An input cell must be recovered from its output. The table $x = 2, y = 0; x = ?, y = 8; x = 8, y = 12$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
2	0
_____	8
8	12

Bank label: _____

Bank label: _____

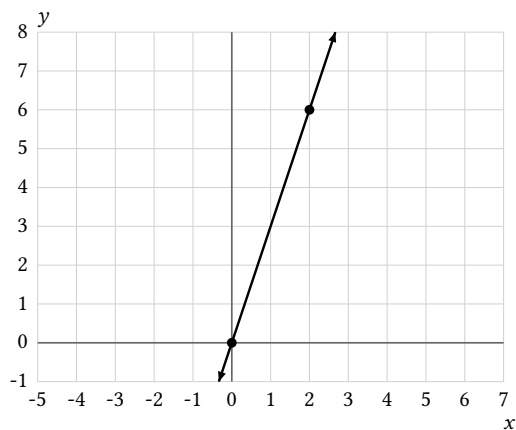
Algebra 1

Slope from Tables and Graphs

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.

An exact line graph marks the points $x = 0, y = 0$; $x = 2, y = 6$. Determine its slope.

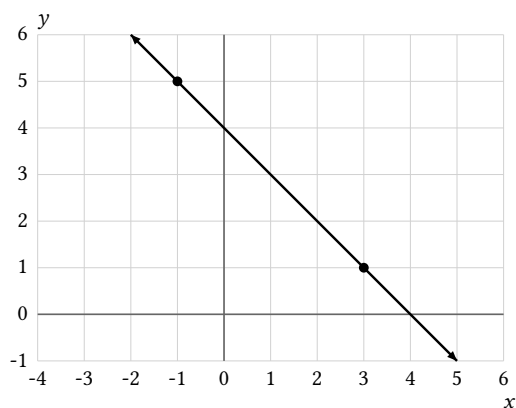


A middle output cell is blank. The table $x = 0, y = 2$; $x = 2, y = ?$; $x = 4, y = 10$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
0	2
2	_____
4	10

On a coordinate graph, the line passes through $x = -1, y = 5$; $x = 3, y = 1$. Read the rise and run from left to right and find m .



Does the table $x = 0, y = 1$; $x = 1, y = 3$; $x = 2, y = 5$; $x = 3, y = 7$ have a constant slope? Support the decision with interval rates.

Input x	Output y
0	1
1	3
2	5
3	7

Algebra 1

Slope from Tables and Graphs

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: The missing value in $x = -\frac{5}{2}, y = -1$; $x = ?, y = 2$; $x = \frac{7}{2}, y = 5$ is $x = \frac{1}{2}$.

The output pattern uses noninteger values. The table $x = 0, y = \frac{2}{3}$; $x = 3, y = ?$; $x = 9, y = \frac{20}{3}$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
0	$\frac{2}{3}$
3	_____
9	$\frac{20}{3}$

Your response: _____

Incoming: On $x = 0$ to $x = 6$, the requested slope is 1, but one global slope is not justified; adjacent average rates are 3, 0, -3.

A fractional input must be reconstructed exactly. The table $x = -\frac{5}{2}, y = -1$; $x = ?, y = 2$; $x = \frac{7}{2}, y = 5$ is declared linear.

Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
$-\frac{5}{2}$	-1
_____	2
$\frac{7}{2}$	5

Your response: _____

Incoming: The missing value in $x = 0, y = \frac{2}{3}$; $x = 3, y = ?$; $x = 9, y = \frac{20}{3}$ is $y = \frac{8}{3}$.

A visually flat segment competes with a steep scaled segment. Graph A: 8 squares right, 2 squares up; each horizontal square is $3x$ -units and each vertical square is $1y$ -units. Graph B: 2 squares right, 8 squares up; each horizontal square is $1x$ -units and each vertical square is $\frac{1}{4}y$ -units. Compare their signed coordinate slopes.

Your response: _____

Incoming: The slope is $-\frac{3}{5}$; the coordinate rise is 6 and the coordinate run is -10.

This table is declared linear: $x = 2, y = -8$; $x = 8, y = -4$; $x = 17, y = 2$. Determine its common slope.

The table is declared linear.

Input x	Output y
2	-8
8	-4
17	2

Your response: _____

Algebra 1

Slope from Tables and Graphs

Name: _____ Date: _____ Class: _____

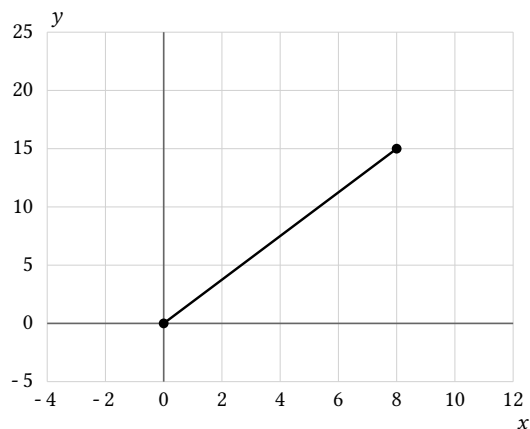
Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

A student reads the table $x = 0, y = 2$; $x = 3, y = 8$ and calls the slope 6. Diagnose the answer.

slope is 6

Input x	Output y
0	2
3	8

A graph moves 4 squares right and 3 up; x -squares represent 2 units and y -squares 5 units. A student reports $\frac{3}{4}$. Audit the scale use.



Slope from Tables and Graphs

Full Worked Solutions - excerpt

Worked example

Problem. The graphs show the same square angle but use different horizontal units. Graph A: 4 squares right, 2 squares up; each horizontal square is $1x$ -units and each vertical square is $1y$ -units. Graph B: 4 squares right, 2 squares up; each horizontal square is $2x$ -units and each vertical square is $1y$ -units. Compare their signed coordinate slopes.

Answer. Graph A has slope $\frac{1}{2}$ and graph B has slope $\frac{1}{4}$; A's signed slope is greater than B's.

Explanation and check.

The graphs show the same square angle but use different horizontal units. After applying both axis scales, compare $\frac{1}{2}$ and $\frac{1}{4}$.

Worked example

Problem. An interior output must share the common rate. The table $x = -3, y = 2$; $x = 1, y = ?$; $x = 5, y = 10$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
-3	2
1	_____
5	10

Answer. The missing value in $x = -3, y = 2$; $x = 1, y = ?$; $x = 5, y = 10$ is $y = 6$.

Explanation and check.

An interior output must share the common rate. Known complete rows give slope 1, and propagating that rate yields 6.

Algebra 1
Positive, Negative, Zero, and Undefined Slope

Positive, Negative, Zero, and Undefined Slope | A1-U05-P04

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
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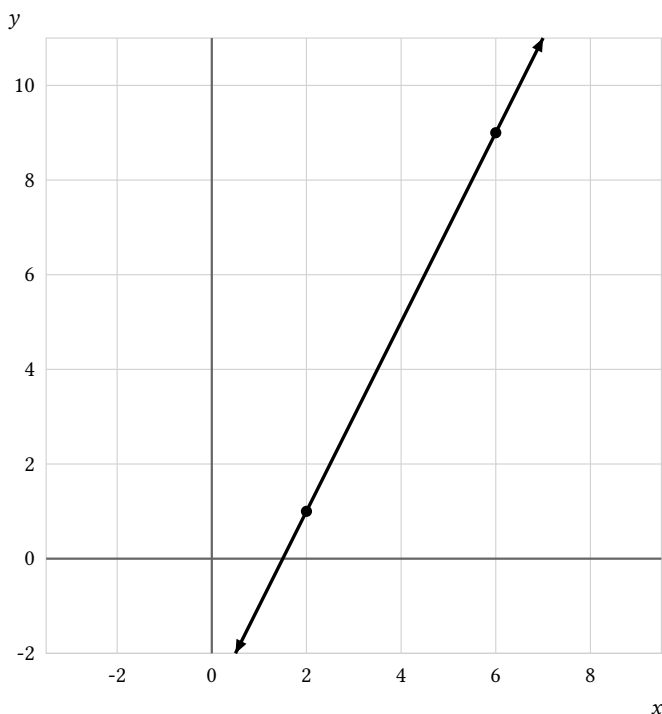
Topic focus
Across 96 tasks this topic asks for positive, negative, zero, or undefined with a decisive reason.
8 PDFs and a README; 92 buyer pages.

Algebra 1

**Positive, Negative, Zero,
and Undefined Slope**

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.

An exact line graph passes through $(2, 1)$, $(6, 9)$. As x increases, classify its slope.

Bank label: _____

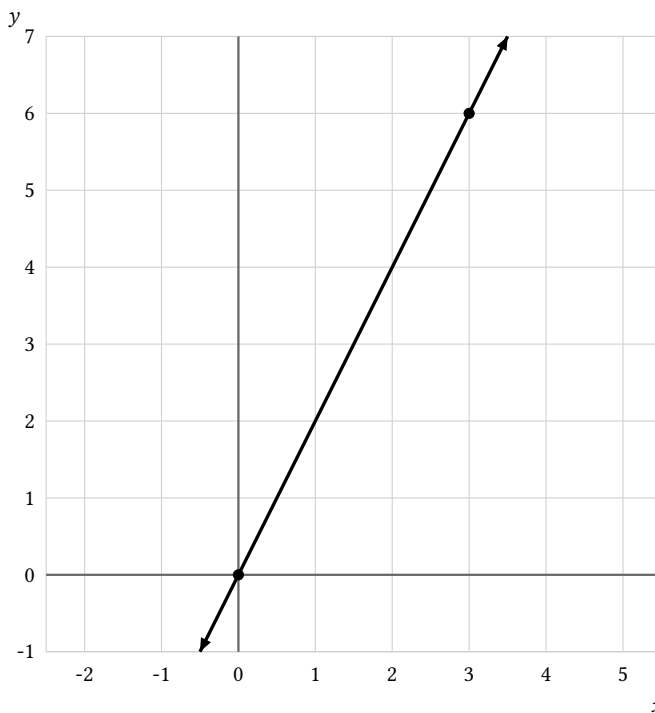
Algebra 1

**Positive, Negative, Zero,
and Undefined Slope**

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.

An exact line graph passes through $(0, 0)$, $(3, 6)$. As x increases, classify its slope.



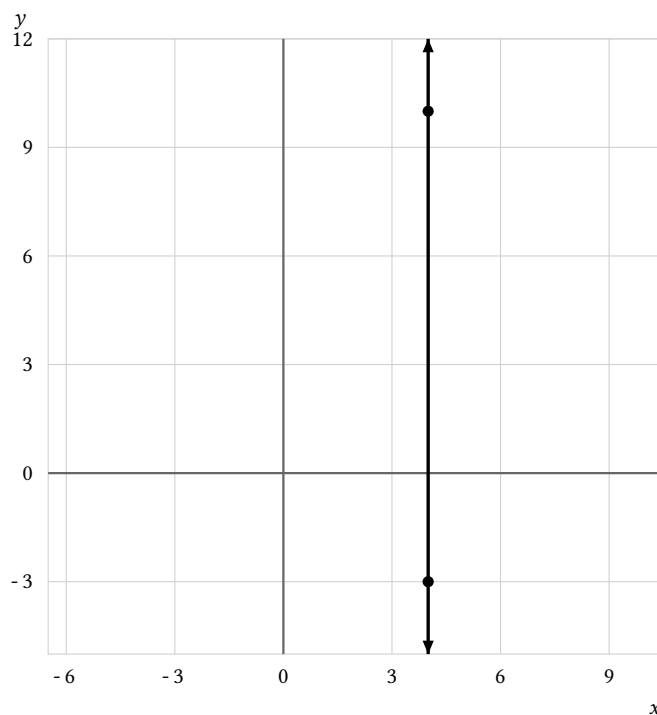
Algebra 1

**Positive, Negative, Zero,
and Undefined Slope**

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 and justify a method before solving (compare coordinate changes, inspect orientation, or calculate rise over run). Then complete the task: A graph through $(4, -3)$, $(4, 10)$ is labeled zero slope because x does not change. Correct the label.

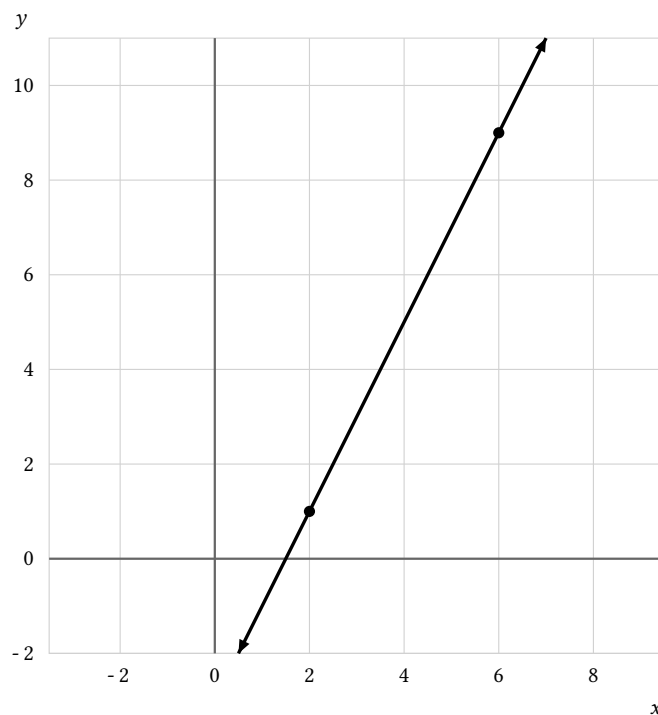


Positive, Negative, Zero, and Undefined Slope

Full Worked Solutions - excerpt

Worked example

Problem. An exact line graph passes through $(2, 1)$, $(6, 9)$. As x increases, classify its slope.



Answer. The line through $(2, 1)$, $(6, 9)$ has positive slope.

Explanation and check.

The signed changes are $\Delta x = 4$ and $\Delta y = 8$; their matching signs make the slope positive.

Algebra 1
Interpreting Slope-Intercept Form

Interpreting Slope-Intercept Form | A1-U05-P05
96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
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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 identified or interpreted slope and vertical intercept with justification.
8 PDFs and a README; 55 buyer pages.

Algebra 1

Interpreting Slope-Intercept 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.

Give the exact y-intercept point for $y = (\frac{3}{5})x + \frac{7}{2}$. _____ Bank label: _____	An account model is $B = 25m - 40$ dollars after m months. Interpret the rate and the signed zero-month value. _____ Bank label: _____
Locate the vertical intercept of $y = -(\frac{4}{7})x - \frac{5}{3}$ using exact coordinates. _____ Bank label: _____	A walker has $d = t$, with d in meters and t in seconds. Explain the implicit m and b. _____ Bank label: _____
Write the y-axis crossing of $y = 0.8x + 2.5$ as (x, y). _____ Bank label: _____	For $y = 5 - 2x$, an annotation says $m = 5$ and $b = -2$. Audit the term roles. _____ Bank label: _____
What intercept point follows from $b = -3.4$ in $y = -1.2x - 3.4$? _____ Bank label: _____	A graph for $y = 7x$ marks the origin and $(1, 7)$, but annotates $m = 7$ and vertical intercept $(0, 7)$. Which part is inconsistent? _____ Bank label: _____

Algebra 1

Interpreting Slope-Intercept Form

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.

Explain the roles of 4 and 3 in the displayed rule $y = 4x + 3$. 	A student says the slope of $y = 3x + 8$ is 8 because it is the last number. Diagnose the reading.
From $y = 2x + 5$, give the vertical-intercept point as an ordered pair. 	A savings plan is $S = 18w + 45$, with S in dollars and w in weeks. Interpret m and b.
Where does the line $y = 4x - 7$ meet the y-axis? Answer with coordinates. 	Tank volume follows $V = -8t + 120$, where t is minutes and V is liters. State what both parameters mean.

Algebra 1

Interpreting Slope-Intercept 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.

The exact graph for $y = -x$ marks $(0, 0)$, $(3, -3)$ and is annotated $m = -1$, $b = 0$. Verify the labels.

A table header for $y = -0.6x - 1.4$ lists rate 0.6 and start 1.4. Audit all signs and translate the start to a point.

A horizontal graph through $(0, 5)$, $(4, 5)$ is labeled $m = 5$ and $b = 5$ for $y = 5$. Audit the labels.

A student labels $x = 7$ with $m = 0$ and $b = 7$ as though it were $y = 0x + 7$. Explain why this is not a valid parameter reading for slope-intercept form.

Interpreting Slope-Intercept Form

Full Worked Solutions - excerpt

Worked example

Problem. Give the exact y -intercept point for $y = (\frac{3}{5})x + \frac{7}{2}$.

Answer. The vertical-intercept point for $y = (\frac{3}{5})x + \frac{7}{2}$ is $(0, \frac{7}{2})$.

Explanation and check.

At the y -axis $x = 0$. Substituting removes the x -term and leaves $y = \frac{7}{2}$, hence $(0, \frac{7}{2})$.

Worked example

Problem. An account model is $B = 25m - 40$ dollars after m months. Interpret the rate and the signed zero-month value.

Answer. In $B = 25m - 40$, when one month passes, balance increases by \$ 25; the balance is -\$ 40 at month 0.

Explanation and check.

The x -variable coefficient describes output change per one input unit: balance increases by \$ 25. The constant describes the zero-input output: the balance is -\$ 40 at month 0.

Algebra 1
Graphing Slope-Intercept Form

Graphing Slope-Intercept Form | A1-U05-P06

96 problems · Four activity formats

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08	Terms of Use & License	included

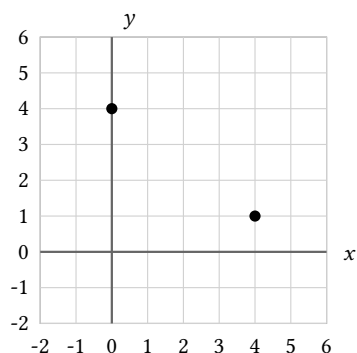
Topic focus
Across 96 tasks this topic asks for an exact graph construction or verification with stated domain.
8 PDFs and a README; 118 buyer pages.

Algebra 1

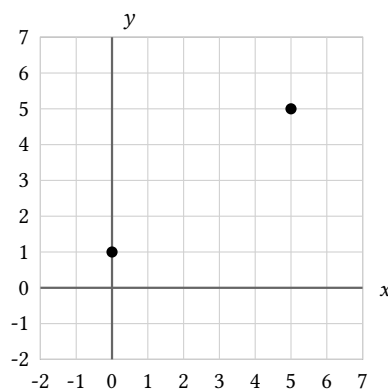
Graphing Slope-Intercept Form

Name: _____ Date: _____ Class: _____

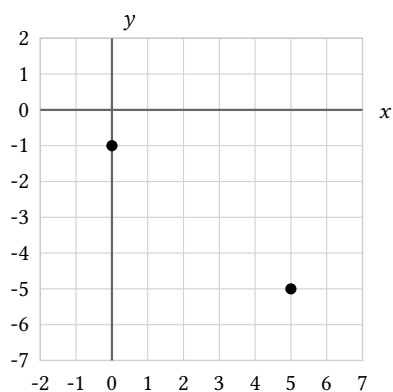
Answer each question and record the matching bank letter. Give exact values. A value without its unit is not a complete answer.

Graph $y = -(\frac{3}{4})x + 4$ by the intercept-and-step method. Specify the starting point and one correctly directed second point.

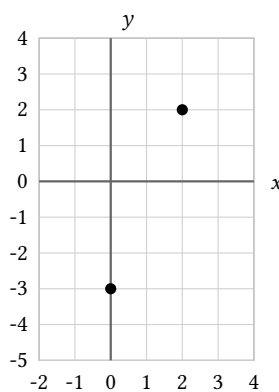
Bank label: _____

Use slope-intercept construction for $y = (\frac{4}{5})x + 1$. Which two exact points can anchor the graph?

Bank label: _____

Graph $y = -(\frac{4}{5})x - 1$ by the intercept-and-step method. Specify the starting point and one correctly directed second point.

Bank label: _____

Use slope-intercept construction for $y = (\frac{5}{2})x - 3$. Which two exact points can anchor the graph?

Bank label: _____

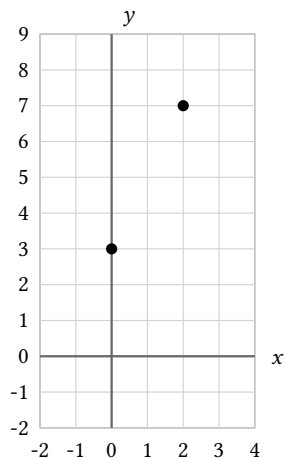
Algebra 1

Graphing Slope-Intercept Form

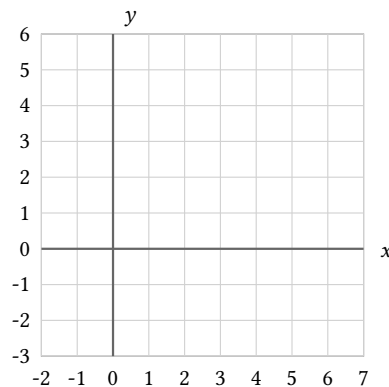
Name: _____ Date: _____ Class: _____

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.

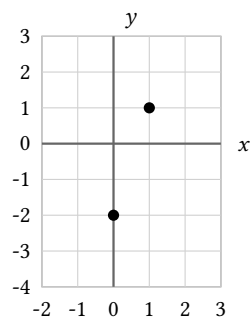
Use slope-intercept construction for $y = 2x + 3$. Which two exact points can anchor the graph?



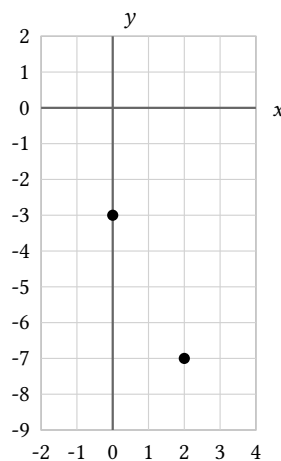
Graph $y = -x + 4$ only on the domain closed at $x = 0$ and closed at $x = 5$. Describe the exact plotted set and every endpoint style.



Use slope-intercept construction for $y = 3x - 2$. Which two exact points can anchor the graph?



Graph $y = -2x - 3$ by the intercept-and-step method. Specify the starting point and one correctly directed second point.



Algebra 1

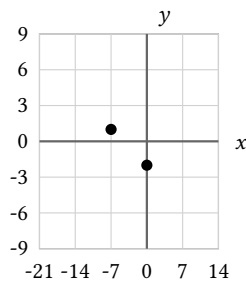
Graphing Slope-Intercept Form

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: Start at $(0, 2)$; move -2 horizontal squares and -1 vertical squares to $(-4, -3)$.

Graph $y = -\left(\frac{3}{7}\right)x - 2$ from its vertical intercept on axes scaled 7 per x -square and 3 per y -square. Describe an efficient leftward step.



Your response: _____

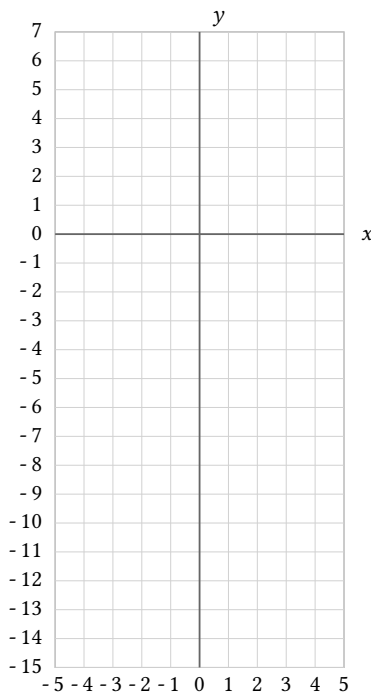
Algebra 1

Graphing Slope-Intercept 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.

A student plots $(-4, 0)$ as the first anchor for $y = 3x - 4$. Correct the construction.

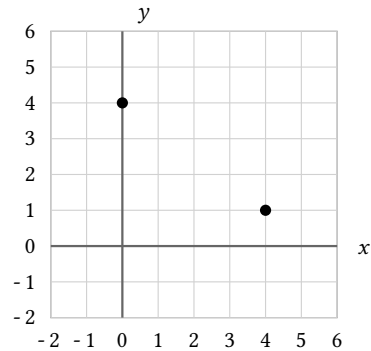


Graphing Slope-Intercept Form

Full Worked Solutions - excerpt

Worked example

Problem. Graph $y = -(\frac{3}{4})x + 4$ by the intercept-and-step method. Specify the starting point and one correctly directed second point.



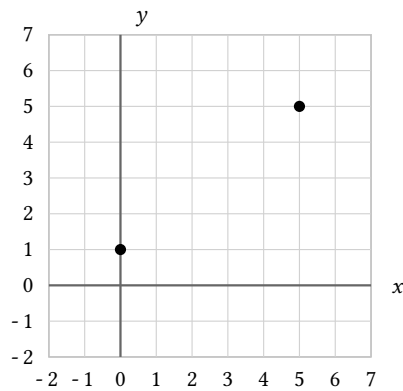
Answer. Plot $(0, 4)$ and $(4, 1)$, then extend the line for $y = -(\frac{3}{4})x + 4$.

Explanation and check.

Plot $(0, 4)$. Using run 4 and rise -3 respects the negative slope and reaches $(4, 1)$.

Worked example

Problem. Use slope-intercept construction for $y = (\frac{4}{5})x + 1$. Which two exact points can anchor the graph?



Answer. Plot $(0, 1)$ and $(5, 5)$, then extend the line for $y = (\frac{4}{5})x + 1$.

Explanation and check.

The constant gives $(0, 1)$; applying rise 4 over run 5 gives $(5, 5)$. Draw the full line through them.

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: _____

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: $b = -2$, so the equation is $y = (-\frac{5}{2})x - 2$. Use the exact parameters $m = 4$ and $b = \frac{3}{5}$ to write a simplified slope-intercept equation. Your response: _____	Incoming: The slope-intercept equation is $y = 4x + \frac{3}{5}$. Using the given slope $m = \frac{1}{3}$ and point $(-6, 5)$, determine the exact value of b and write $y = mx + b$. Your response: _____
Incoming: $b = 4$, so the equation is $y = (\frac{5}{2})x + 4$. Using the given slope $m = -\frac{5}{2}$ and point $(-2, 3)$, determine the exact value of b and write $y = mx + b$. Your response: _____	Incoming: $b = 17$, so the equation is $y = -6x + 17$. A line through $(4, 11)$ has known slope 3. Recover its vertical intercept and write the isolated equation. Your response: _____
Incoming: The slope-intercept equation is $y = (-\frac{3}{4})x + 2$. Using the given slope $m = -\frac{3}{4}$ and point $(8, 1)$, determine the exact value of b and write $y = mx + b$. Your response: _____	Incoming: $b = -12$, so the equation is $y = -3x - 12$. Given $m = \frac{3}{4}$ and $(-8, -1)$, work computes $(\frac{3}{4})(-8)$ as $-\frac{3}{2}$, leading to $b = \frac{1}{2}$. Repair the arithmetic and equation. Your response: _____

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: _____

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.

Write point-slope form for slope 2 through (3, 5). 	Determine whether the anchored equations $y - 1 = (2)(x)$ and $y - 7 = (2)(x - 3)$ define the same line. Compare direction and anchor incidence without converting both to slope-intercept form.
Determine whether the anchored equations $y - 4 = -(x)$ and $y - 5 = -(x - 2)$ define the same line. Compare direction and anchor incidence without converting both to slope-intercept form. 	For slope 2 through $(-3, 5)$, work writes $y - 5 = 2(x - 3)$. Diagnose the anchor sign.
A line has slope 3 and anchor $(-2, 4)$. Write point-slope form, simplifying subtraction of negative coordinates correctly. 	A line has slope 1 and anchor $(-4, -3)$. Write point-slope form, simplifying subtraction of negative coordinates correctly.

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
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 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: _____

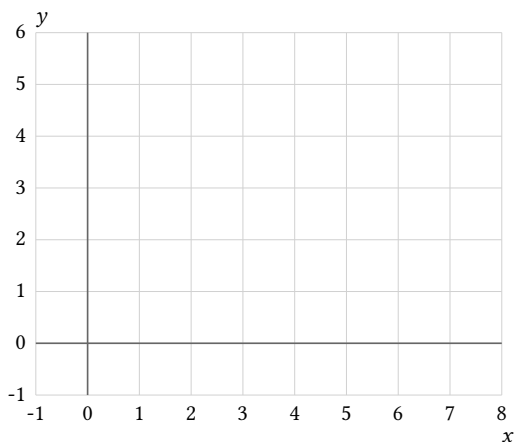
Algebra 1

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
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 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: _____

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
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 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: _____

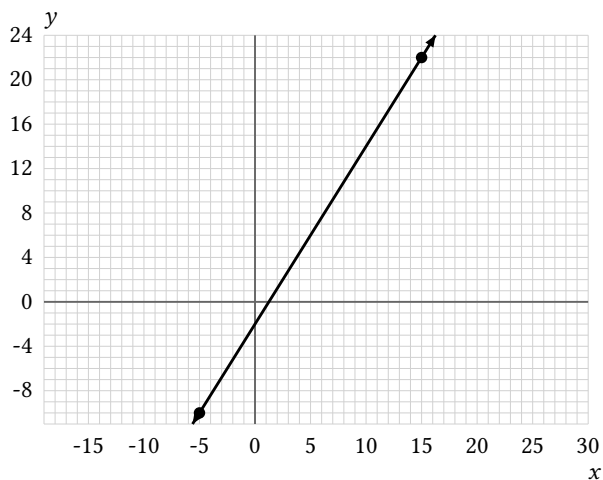
Recover the linear function through $(1, 3)$, $(4, 0)$. Keep the subtraction order consistent when finding its negative slope.

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.

Algebra 1

Horizontal and Vertical Lines

Horizontal and Vertical Lines | A1-U05-P12

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 equation, graph description, membership set, or justified function conclusion.

8 PDFs and a README; 71 buyer pages.

Algebra 1

Horizontal and Vertical Lines

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: _____

Algebra 1

Horizontal and Vertical Lines

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.

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.

Algebra 1

Horizontal and Vertical Lines

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 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.

Horizontal and Vertical Lines

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.

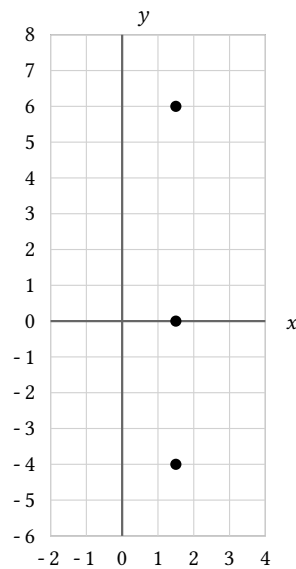
Answer. For $y = \frac{7}{4}$: Every point $(x, \frac{7}{4})$ lies on $y = \frac{7}{4}$; the missing x may be any real number.

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 $x = \frac{3}{2}$.

Algebra 1
Perpendicular Lines

Equations of Parallel and Perpendicular Lines | A1-U05-P14

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 equation, coordinate, parameter set, or justified verdict.
8 PDFs and a README; 71 buyer pages.

Algebra 1

Perpendicular Lines

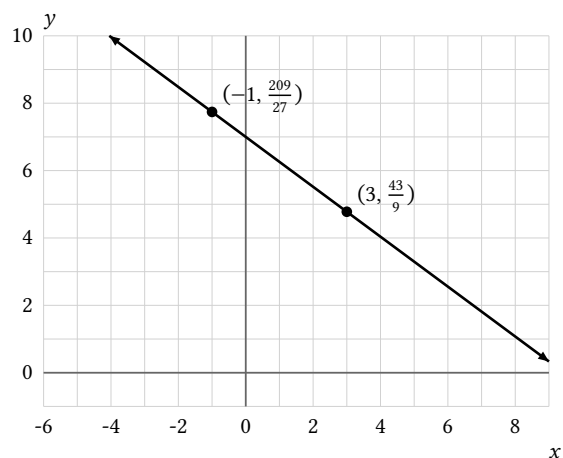
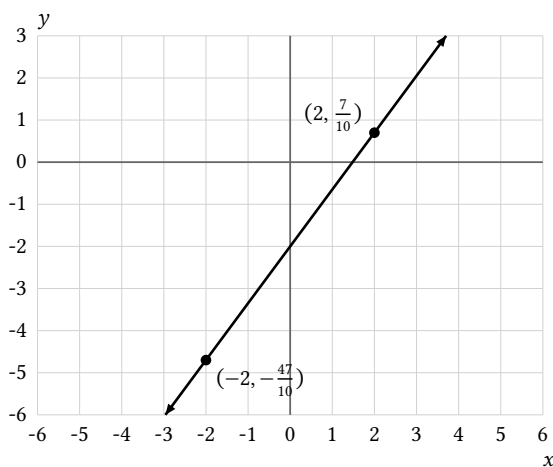
Name: _____ Date: _____ Class: _____

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

Construct the exact line through $(-1, 5)$ perpendicular to the reference $y - 7 = -3(x + 2)$. Show how the direction exception or negative reciprocal is used.

Bank label: _____

Determine whether line A through $(-2, -\frac{47}{10})$ and $(2, \frac{7}{10})$ and line B through $(-1, \frac{209}{27})$ and $(3, \frac{43}{9})$ are perpendicular. Recover both exact directions and account for axis-parallel exceptions.



Bank label: _____

Algebra 1

Perpendicular Lines

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.

Complete the second point $(u, 10)$ so its line with $(0, -3)$ is perpendicular to the reference direction. Determine u. The reference is parallel to $y = -\frac{5}{6}x$. Reject a repeated-point result. _____ _____	Reference: $y = \frac{9}{7}x - 1$. Candidate: $y = (\frac{4}{7}t + \frac{1}{7})x + 7$. Find t so the lines are perpendicular. _____ _____
A line perpendicular to the reference direction must pass through $(-\frac{7}{3}, 5)$ and $(\frac{13}{6}, u)$. Recover u. The reference is parallel to vertical line $x = \frac{11}{4}$. Reject a repeated-point result. _____ _____	Construct the exact line through $(-6, \frac{5}{2})$ perpendicular to the reference $2y = 5$. Show how the direction exception or negative reciprocal is used. _____ _____
Construct the exact line through $(1, 4)$ perpendicular to the reference $x = -5$. Show how the direction exception or negative reciprocal is used. _____ _____	Complete the second point $(u, 6)$ so its line with $(7, -4)$ is perpendicular to the reference direction. Determine u. The reference is parallel to $y = 0x$. Reject a repeated-point result. _____ _____

Algebra 1

Perpendicular Lines

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: $u = -7$; the completed second point is $(5, -7)$. Construct the exact line through $(8, -8)$ perpendicular to the reference $y - \frac{33}{4} = -\frac{13}{8}(x + 2)$. Show how the direction exception or negative reciprocal is used. Your response: _____	Incoming: The perpendicular line through $(8, -8)$ is $y = \frac{8}{13}x - \frac{168}{13}$. The displacement $\langle 4, -1 \rangle$ descends as it moves right. Make a clockwise quarter-turn and explain why the resulting direction is perpendicular. Your response: _____
Incoming: $u = 1$; the completed second point is $(1, 7)$. A line perpendicular to the reference direction must pass through $(0, 3)$ and $(5, u)$. Recover u. The reference is parallel to $y = \frac{1}{2}x$. Reject a repeated-point result. Your response: _____	Incoming: $u = \frac{6733}{2205}$; the completed second point is $(-\frac{17}{7}, \frac{6733}{2205})$. Reference: $y = \frac{1}{2}x - 2$. Candidate: $y = (\frac{3}{2}t - \frac{1}{2})x + 6$. Find t so the lines are perpendicular. Your response: _____

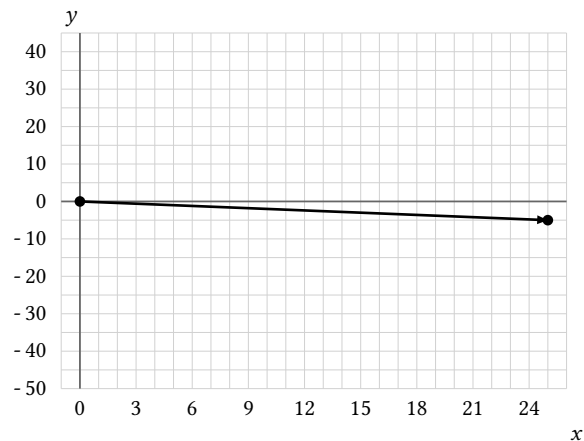
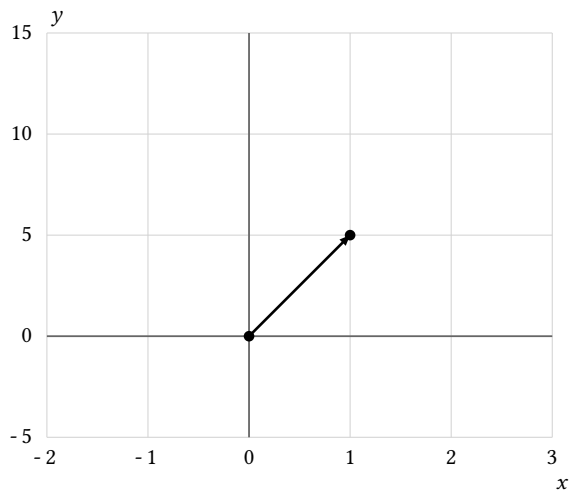
Algebra 1

Perpendicular Lines

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.

Evidence: A graph uses x -scale 1 per tick and y -scale 5 per tick. A moves 1 tick right and 1 up; B moves 25 ticks right and 1 down. Judge the perpendicularity claim from coordinate evidence, and explain any effect of plotting scale.



Perpendicular Lines

Full Worked Solutions - excerpt

Worked example

Problem. Construct the exact line through $(-1, 5)$ perpendicular to the reference $y - 7 = -3(x + 2)$. Show how the direction exception or negative reciprocal is used.

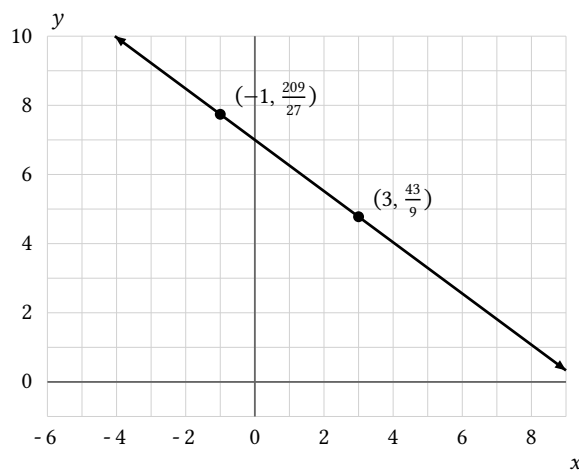
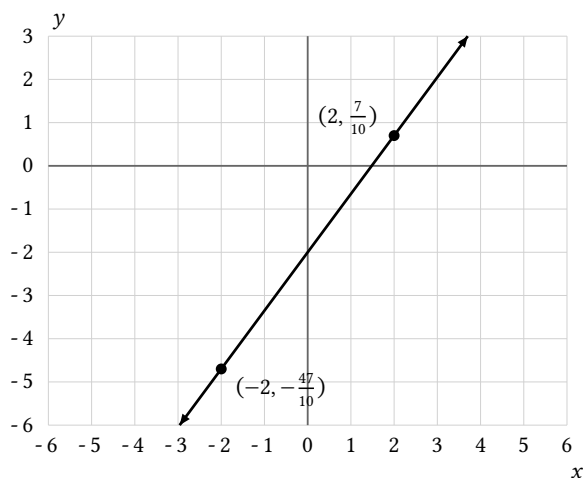
Answer. The perpendicular line through $(-1, 5)$ is $y = \frac{1}{3}x + \frac{16}{3}$.

Explanation and check.

Use the coefficient in point-slope form as the reference direction and take its negative reciprocal. The perpendicular slope is $\frac{1}{3}$; imposing the point gives intercept $\frac{16}{3}$.

Worked example

Problem. Determine whether line A through $(-2, -\frac{47}{10})$ and $(2, \frac{7}{10})$ and line B through $(-1, \frac{209}{27})$ and $(3, \frac{43}{9})$ are perpendicular. Recover both exact directions and account for axis-parallel exceptions.



Answer. For $y = \frac{27}{20}x - 2$ and $y = -\frac{20}{27}x + 7$, the verdict is perpendicular. The exact slope product is -1 , equal to -1 .

Explanation and check.

The exact slope product is -1 , equal to -1 .

Algebra 1
Direct Variation

Direct Variation | A1-U05-P15
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 rule, value, graph description, or justified verdict.
8 PDFs and a README; 72 buyer pages.

Algebra 1

Direct Variation

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.

Scale the fractional proportional pair $(21, -14)$ to the target input $-\frac{9}{2}$.
Give the exact target output.

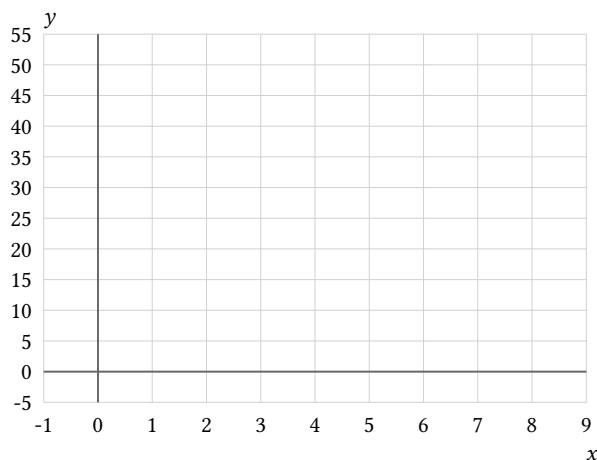
Input x	Output y
21	-14

Bank label: _____

A direct-variation constant is $\frac{17}{6}$ dollars per hour. In the new units, each output number is multiplied by 100 and each input number by 3600. Find the constant in cents per second and verify an equivalent pair.

Bank label: _____

Construct the graph of $y = 6x$ on the domain $2 \leq x < 8$. Use the exact sample inputs 2, 5, 7 and state whether points should be connected.



Bank label: _____

The declared domain currently includes only input 0, with output 0. Can the constant of direct variation be recovered uniquely? State the full set of possible constants.

Bank label: _____

Algebra 1

Direct Variation

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.

Determine whether this exact relation is a direct variation: the relation $6y + 3 = 12x$. Explain which required invariant is decisive. 	A declared $y = kx$ relation contains the fractional pair $(8, 6)$. Compute the exact quotient and write the rule. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <th style="padding: 5px;">Input x</th> <th style="padding: 5px;">Output y</th> </tr> <tr> <td style="padding: 5px;">8</td> <td style="padding: 5px;">6</td> </tr> </table> 	Input x	Output y	8	6				
Input x	Output y								
8	6								
The fractional direct-variation pair $(14, -\frac{11}{2})$ is known. Recover the input that would produce $y = \frac{33}{8}$. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <th style="padding: 5px;">Input x</th> <th style="padding: 5px;">Output y</th> </tr> <tr> <td style="padding: 5px;">14</td> <td style="padding: 5px;">$-\frac{11}{2}$</td> </tr> </table> 	Input x	Output y	14	$-\frac{11}{2}$	Scale the fractional proportional pair $(\frac{11}{4}, -\frac{13}{6})$ to the target input $-\frac{9}{5}$. Give the exact target output. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <th style="padding: 5px;">Input x</th> <th style="padding: 5px;">Output y</th> </tr> <tr> <td style="padding: 5px;">$\frac{11}{4}$</td> <td style="padding: 5px;">$-\frac{13}{6}$</td> </tr> </table> 	Input x	Output y	$\frac{11}{4}$	$-\frac{13}{6}$
Input x	Output y								
14	$-\frac{11}{2}$								
Input x	Output y								
$\frac{11}{4}$	$-\frac{13}{6}$								
A graph marks the origin but gives no other point or slope. Can the constant of direct variation be recovered uniquely? State the full set of possible constants. 	A declared $y = kx$ relation contains the fractional pair $(\frac{3}{2}, 9)$. Compute the exact quotient and write the rule. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <th style="padding: 5px;">Input x</th> <th style="padding: 5px;">Output y</th> </tr> <tr> <td style="padding: 5px;">$\frac{3}{2}$</td> <td style="padding: 5px;">9</td> </tr> </table> 	Input x	Output y	$\frac{3}{2}$	9				
Input x	Output y								
$\frac{3}{2}$	9								

Algebra 1**Direct Variation****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.

Audit this direct-variation reasoning: From the pair $(4, 12)$, a student reports $k = \frac{x}{y} = \frac{1}{3}$ in $y = kx$. Identify the first invalid inference and correct it.

Audit this direct-variation reasoning: Two constraints demand $k = \frac{5}{3}$ and $k = \frac{10}{6}$; a student treats the fractions as different and rejects the model. Identify the first invalid inference and correct it.

Audit this direct-variation reasoning: A table includes $(0, 5), (2, 6), (4, 12)$. A student ignores the zero row because $\frac{y}{x}$ cannot be formed there. Identify the first invalid inference and correct it.

Audit this direct-variation reasoning: A student calls $y = 3x + 2$ a direct variation because its slope is constant. Identify the first invalid inference and correct it.

Direct Variation

Full Worked Solutions - excerpt

Worked example

Problem. Scale the fractional proportional pair $(21, -14)$ to the target input $-\frac{9}{2}$. Give the exact target output.

Input x	Output y
21	-14

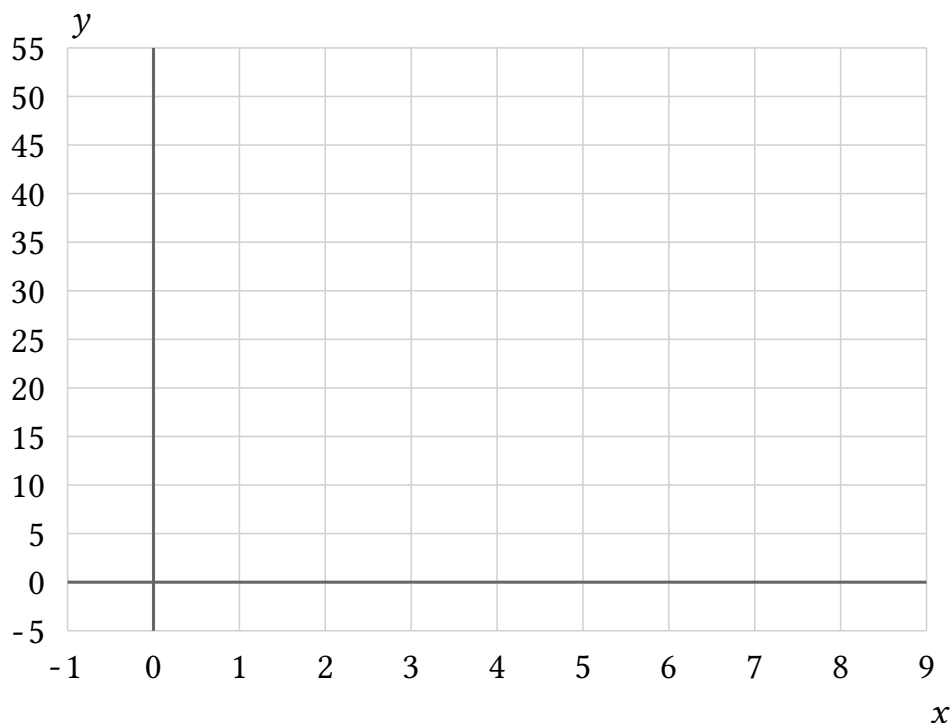
Answer. Using the known pair $(21, -14)$, $y = 3$ at $x = -\frac{9}{2}$; $k = -\frac{2}{3}$.

Explanation and check.

The exact ratio is $-\frac{2}{3}$. Fraction multiplication gives $(-\frac{2}{3})(-\frac{9}{2}) = 3$.

Worked example

Problem. Construct the graph of $y = 6x$ on the domain $2 \leq x < 8$. Use the exact sample inputs 2, 5, 7 and state whether points should be connected.



Answer. Plot $(2, 12)$, $(5, 30)$, $(7, 42)$. Use a continuous segment or ray only over the declared interval. The displayed domain excludes or does not sample 0, although the zero-offset rule is still proportional.

Explanation and check.

Each output is kx with $k = 6$. Use a continuous segment or ray only over the declared interval. The displayed domain excludes or does not sample 0, although the zero-offset rule is still proportional.

Algebra 1
Linear Models from Initial Value and Rate

Linear Models from Initial Value and Rate | A1-U05-P16

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 affine rule, domain, interpretation, or corrected model.
8 PDFs and a README; 50 buyer pages.

Algebra 1

Linear Models from Initial Value and Rate

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.

At use count 18, 250 grams remain and 15 grams are used per count. Construct an anchored linear model and then rewrite it to identify $Q(0)$. Do not treat the value at $t = 18$ as the intercept. _____ Bank label: _____	At week 40, a fund is 1000 dollars and then changes -22 dollars per week. Construct an anchored linear model and then rewrite it to identify $Q(0)$. Do not treat the value at $t = 40$ as the intercept. _____ Bank label: _____
A vertical coordinate starts at 3 units and changes by $-\frac{7}{3}$ units per step. Let t be the number of steps. Construct $Q(t)$ in units; identify the value at $t = 0$ and preserve the sign of the supplied rate. _____ Bank label: _____	At $t = -8$ relative to calibration, a signal is 12 and rises $\frac{5}{2}$ per time unit. Construct an anchored linear model and then rewrite it to identify $Q(0)$. Do not treat the value at $t = -8$ as the intercept. _____ Bank label: _____
An inventory starts at 100 and processes at most 8 whole orders. Use the supplied initial-rate rule $Q(t) = 100 - 12t$. State the valid domain for t in orders, combining input type with the process limit. _____ Bank label: _____	For the contextual model $Q(t) = 4 - \frac{1}{3}t$ on domain $-6 \leq t \leq 0$, explain the intercept and slope in the original units and say whether $Q(0)$ is observed or extrapolated. Q is a historical offset and $t = 0$ is the end of the observation window. _____ Bank label: _____
A process has initial value 9 miles and rate 45 miles per hour. Express its model using meters and input measured in seconds; output counts multiply by $\frac{201168}{125}$ and input counts by 3600. _____ Bank label: _____	For the contextual model $Q(t) = 31 + 5t$ on domain $t \geq 7$, explain the intercept and slope in the original units and say whether $Q(0)$ is observed or extrapolated. Q is a quantity measured from a baseline date, but observations start seven periods later. _____ Bank label: _____

Algebra 1

Linear Models from Initial Value and Rate

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 temperature deviation rises from -10 to a cutoff of 8. Use the supplied initial-rate rule $Q(t) = -10 + \frac{9}{4}t$. State the valid domain for t in hours, combining input type with the process limit. _____ _____	A signed elevation is -5 meters at time zero and falls 2 meters per kilometer traveled. Let t be the number of kilometers. Construct $Q(t)$ in meters; identify the value at $t = 0$ and preserve the sign of the supplied rate. _____ _____
A process has initial value 2 liters and rate 6 liters per package. Express its model using liters and input measured in items; output counts multiply by 1 and input counts by 3. _____ _____	A process has initial value $\frac{13}{6}$ gallons and rate $-\frac{17}{9}$ gallons per hour. Express its model using quarts and input measured in minutes; output counts multiply by 4 and input counts by 60. _____ _____
A process has initial value 12 liters and rate 5 liters per hour. Express its model using milliliters and input measured in minutes; output counts multiply by 1000 and input counts by 60. _____ _____	At $t = \frac{3}{2}$ days, a total is 9 and grows 4 units per day. Construct an anchored linear model and then rewrite it to identify $Q(0)$. Do not treat the value at $t = \frac{3}{2}$ as the intercept. _____ _____

Algebra 1

Linear Models from Initial Value and Rate

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: At $t = 4$, $A = 18$ and $B = 17$. Both initial value and rate change, so neither parameter alone explains the output gap. For the contextual model $Q(t) = -5 - 4t$ on domain $-2 \leq t \leq 6$, explain the intercept and slope in the original units and say whether $Q(0)$ is observed or extrapolated. Q is position relative to a marker and $t = 0$ is a chosen clock reference. Your response: _____	Incoming: In $Q(t) = -5 - 4t$, -5 is observed at the chosen zero; -4 is the signed output change per one input unit. Context: Q is position relative to a marker and $t = 0$ is a chosen clock reference. Models $A(t) = 18 - \frac{1}{2}t$ and $B(t) = 18 - \frac{3}{4}t$ have the same starting value. Explain how the changed rate affects later outputs and compare them at $t = 10$. Your response: _____
Incoming: In $Q(t) = 72 - 9t$, 72 is observed at the chosen zero; -9 is the signed output change per one input unit. Context: Q is percentage points remaining, not a multiplicative percent change. Compare the redesigned affine models $A(t) = -10 + 7t$ and $B(t) = 5 + 3t$. Separate the start change from the rate change before checking $t = 4$. Your response: _____	Incoming: At $t = 6$, $A = 100$ and $B = 120$. Both initial value and rate change, so neither parameter alone explains the output gap. For the contextual model $Q(t) = 500 + 20t$ on domain $0 \leq t \leq 6$, explain the intercept and slope in the original units and say whether $Q(0)$ is observed or extrapolated. Q includes a fixed setup contribution plus production over hours. Your response: _____
Incoming: At $t = 7$, $A = 44$ and $B = 65$. The models start together, and their rate difference changes the gap with t. For the contextual model $Q(t) = 90$ on domain $0 \leq t \leq 12$, explain the intercept and slope in the original units and say whether $Q(0)$ is observed or extrapolated. Q is a fixed sensor reading and t is hours. Your response: _____	Incoming: $Q(t) = 0 + \frac{7}{3}(t - 12)$, equivalently $Q(t) = -28 + \frac{7}{3}t$; therefore $Q(0) = -28$. A process has initial value 0 items and rate 300 items per hour. Express its model using items and input measured in minutes; output counts multiply by 1 and input counts by 60. Your response: _____

Algebra 1

Linear Models from Initial Value and Rate

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. Compare the redesigned affine models $A(t) = 500 + 20t$ and $B(t) = 450 + 25t$. Separate the start change from the rate change before checking $t = 4$.

Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Both parameters differ in $A(t) = 8 + \frac{3}{2}t$ and $B(t) = 12 + \frac{1}{2}t$. Compare the exact rational starts and rates, then evaluate each at $t = 6$.

Models $A(t) = 10 + 3t$ and $B(t) = 16 + 3t$ share one rate. Isolate the effect of changing the initial value, then check the fixed gap at $t = 4$.

Models $A(t) = 6 + 12t$ and $B(t) = 9 + 12t$ share one rate. Isolate the effect of changing the initial value, then check the fixed gap at $t = \frac{5}{2}$.

Linear Models from Initial Value and Rate

Full Worked Solutions - excerpt

Worked example

Problem. At use count 18, 250 grams remain and 15 grams are used per count. Construct an anchored linear model and then rewrite it to identify $Q(0)$. Do not treat the value at $t = 18$ as the intercept.

Answer. $Q(t) = 250 - 15(t - 18)$, equivalently $Q(t) = 520 - 15t$; therefore $Q(0) = 520$.

Explanation and check.

Start from the reference form using $(t - 18)$ and rate -15 . Expanding gives the initial value

$$250 - (-15)(18) = 520$$

Worked example

Problem. At week 40, a fund is 1000 dollars and then changes -22 dollars per week. Construct an anchored linear model and then rewrite it to identify $Q(0)$. Do not treat the value at $t = 40$ as the intercept.

Answer. $Q(t) = 1000 - 22(t - 40)$, equivalently $Q(t) = 1880 - 22t$; therefore $Q(0) = 1880$.

Explanation and check.

Start from the reference form using $(t - 40)$ and rate -22 . Expanding gives the initial value

$$1000 - (-22)(40) = 1880$$

Algebra 1
Evaluating Linear Models in Context

Evaluating Linear Models in Context | A1-U05-P17

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 prediction with a context-qualified conclusion.
8 PDFs and a README; 50 buyer pages.

Algebra 1

Evaluating Linear Models
in Context

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 newly appended row has input 4 and output $\frac{47}{6}$. Test it against $Q(t) = -\frac{5}{2} + \frac{7}{3}t$ with absolute tolerance $\frac{1}{2}$, and say what an out-of-band result establishes. _____ Bank label: _____	A supporting table covers inputs -8 through -1, and the rule's domain is $-10 \leq t \leq 3$. Locate $t = -5$ relative to the evidence and classify this within-span prediction. _____ Bank label: _____
For the supplied rule $Q(t) = \frac{11}{3} + \frac{13}{7}t$, evaluate at $t = 14$ and compare with observed value 29. Use $\text{observed-predicted} \leq \frac{2}{3}$ as the consistency rule. _____ Bank label: _____	A supporting table covers inputs 0 through 18, and the rule's domain is $0 \leq t \leq 20$. Locate $t = 11$ relative to the evidence and classify this within-span prediction. _____ Bank label: _____
The supplied model is $Q(t) = 18 + 7t$ on t in $\{0, 1, \dots, 12\}$. At what t, measured in batches, does Q reach 60? Solve and verify that the predicted input is admissible. _____ Bank label: _____	For the forecast $Q(t) = 18 + 5t$ at $t = 12$, the intercept changes by 7 and the rate changes by -1. Combine the two effects exactly and state the net prediction change. _____ Bank label: _____
The supplied model is $Q(t) = 25 + 11t$ on t in $\{0, 1, \dots, 10\}$. At what t, measured in days, does Q reach 102? Solve and verify that the predicted input is admissible. _____ Bank label: _____	The supplied forecast is $Q(t) = \frac{9}{2} + \frac{7}{3}t$. At $t = 3$ it is being used under this condition: completed packages must be whole. Compute the output and decide whether the contextual interpretation is feasible; identify the decisive condition. _____ Bank label: _____

Algebra 1

Evaluating Linear Models in Context

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.

Evidence in a table stops at the span $[0, 7]$, and the model itself is restricted to $0 \leq t \leq 12$. Assess the proposed forecast input 16 against both limits.

Audit this forecast statement: A rule gives distance in miles with t in hours. A student evaluates it correctly but reports the result as miles per hour. Identify the first unjustified step and write a repaired, qualified conclusion.

The first and last tabulated inputs are 9 and 27. For domain $0 \leq t \leq 35$, classify use of the rule exactly at $t = 27$ and distinguish an endpoint from beyond-range use.

A student states a conclusion from the visible representation without preserving all stated associations, constraints, or units. Diagnose the specific reasoning error, then complete the original task: Audit this forecast statement: A rate 2.46 is rounded to 2 before multiplying by 18, and the final forecast is reported to the nearest tenth. Identify the first unjustified step and write a repaired, qualified conclusion.

Evaluating Linear Models in Context

Full Worked Solutions - excerpt

Worked example

Problem. A newly appended row has input 4 and output $\frac{47}{6}$. Test it against $Q(t) = -\frac{5}{2} + \frac{7}{3}t$ with absolute tolerance $\frac{1}{2}$, and say what an out-of-band result establishes.

Answer. The model predicts $\frac{41}{6}$; residual observed-predicted is 1, whose absolute value is 1. That is outside the tolerance $\frac{1}{2}$, so the observation is not consistent with the model at this tolerance. This comparison alone does not establish a cause.

Explanation and check.

Prediction $\frac{41}{6}$ and observation $\frac{47}{6}$ have absolute gap 1, larger than allowed tolerance $\frac{1}{2}$.

Worked example

Problem. A supporting table covers inputs -8 through -1 , and the rule's domain is $-10 \leq t \leq 3$. Locate $t = -5$ relative to the evidence and classify this within-span prediction.

Answer. This is interpolation: -5 lies strictly between observed inputs -8 and -1 . It is inside the declared model domain, but the classification alone does not guarantee empirical accuracy; continued linear behavior is an assumption wherever direct observations are absent.

Explanation and check.

The requested input lies between -8 and -1 , so the prediction uses the model within the observed span.

Algebra 1

Transformations of Linear Functions

Transformations of Linear Functions | A1-U05-P18

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 transformed rule, coordinate map, domain, or justified comparison.

8 PDFs and a README; 55 buyer pages.

Algebra 1

Transformations of Linear Functions

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.

Starting from $f(x) = \frac{7}{6}x - \frac{5}{2}$, shift every output by $\frac{5}{2}$. Write g , and compare its slope and y -intercept with f .

The original line contains $(-\frac{1}{3}, \frac{5}{2})$, $(\frac{8}{3}, -\frac{7}{2})$. Translate coordinates by the map x to $x + \frac{4}{3}$ and y to $y - \frac{5}{6}$. List every image point and verify that the same displacement was used throughout.

x	y
$-\frac{1}{3}$	$\frac{5}{2}$
$\frac{8}{3}$	$-\frac{7}{2}$
$\frac{8}{3}$	$-\frac{7}{2}$

Bank label: _____

Bank label: _____

Starting with $f(x) = 9x - 2$, shift input coordinates right 3, scale all resulting outputs by 0, and finally shift outputs by -5 . Compose all three stages in order.

For $f(x) = -5x + 8$, analyze the proposed change 'horizontal right 4' without plotting every point. State what happens to parallelism and cite the controlling parameter invariant.

Bank label: _____

Bank label: _____

Algebra 1

Transformations of Linear Functions

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.

Beginning with $f(x) = -8x + 6$, reflect/scale every output by -1 and afterward translate outputs by 0. Expand the whole intermediate function before applying the final shift. 	Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Points $(-6, 4), (9, -6)$ lie on the original line. Apply the axis-scale map x to $-\frac{2}{3}x$, y to y, then list the exact images and describe any reflection or collapse. <table border="1" data-bbox="824 638 1468 735"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>-6</td> <td>4</td> </tr> <tr> <td>9</td> <td>-6</td> </tr> </tbody> </table> 	x	y	-6	4	9	-6
x	y						
-6	4						
9	-6						
Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Apply the input operation $g(x) = f(-x)$ to $f(x) = -\frac{13}{9}x + \frac{17}{5}$. Expand g and state how an original x-coordinate is mapped. 	ALPHA: The rules $f(x) = -4x + 7$ and $g(x) = -4x + 12$ are accompanied by this correspondence evidence: point $(2, -1)$ maps to $(2, 4)$. Does the added evidence resolve the otherwise nonunique shift description? 						
Assume the named family 'hshift' only. Can $f(x) = -4x - 6$ be transformed into $g(x) = -4x + 14$? Recover the parameter if possible, or identify the incompatible feature. 	Assume the named family 'xscale' only. Can $f(x) = 5$ be transformed into $g(x) = 5$? Recover the parameter if possible, or identify the incompatible feature. 						

Algebra 1

Transformations of Linear Functions

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. Map the collinear points $(-\frac{9}{2}, \frac{7}{3})$, $(\frac{3}{2}, -\frac{5}{3})$ using x to $-\frac{2}{3}x + \frac{11}{4}$ and y to $\frac{5}{2}y$. Compute every exact image and use the common affine coordinate rule to verify the transformed line.

x	y
$-\frac{9}{2}$	$\frac{7}{3}$
$\frac{3}{2}$	$-\frac{5}{3}$

Complete the task, then compare the direct graph approach with an equivalent check. Explain why both support the same conclusion. Assume the named family 'hshift' only. Can $f(x) = \frac{7}{5}x + \frac{13}{6}$ be transformed into $g(x) = \frac{7}{5}x - \frac{61}{30}$? Recover the parameter if possible, or identify the incompatible feature.

Transformations of Linear Functions

Full Worked Solutions - excerpt

Worked example

Problem. Starting from $f(x) = \frac{7}{6}x - \frac{5}{2}$, shift every output by $\frac{5}{2}$. Write g , and compare its slope and y -intercept with f .

Answer. $g(x) = \frac{7}{6}x$. The slope remains $\frac{7}{6}$ and the y -intercept changes from $-\frac{5}{2}$ to 0.

Explanation and check.

An output shift adds $\frac{5}{2}$ only to the intercept; it does not change the rate of change.

Worked example

Problem. The original line contains $(-\frac{1}{3}, \frac{5}{2}), (\frac{8}{3}, -\frac{7}{2})$. Translate coordinates by the map x to $x + \frac{4}{3}$ and y to $y - \frac{5}{6}$. List every image point and verify that the same displacement was used throughout.

x	y
$-\frac{1}{3}$	$\frac{5}{2}$
$\frac{8}{3}$	$-\frac{7}{2}$

Answer. Mapped points: $(1, \frac{5}{3}), (4, -\frac{13}{3})$. The same coordinate rule is applied to each point.

Explanation and check.

Add the specified coordinate displacements to each point; the image list is $(1, \frac{5}{3}), (4, -\frac{13}{3})$.