Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Scatter Plots to Regression Diagnostics | Algebra 1 | 8-Topic Bundle

8-topic bundle | 768 problems | Four activity formats

Included topics

The following pages list all 8 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.

64 PDFs and 8 READMEs; 981 buyer PDF pages across the 8 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.

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Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Included topics

8-topic bundle | 768 problems | Four activity formats

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01 **Scatter Plots and Bivariate Data**

View individual product and its full preview

02 **Correlation and Linear Association**

View individual product and its full preview

03 **Correlation vs Causation**

View individual product and its full preview

04 **Lines of Best Fit**

View individual product and its full preview

05 **Interpreting Regression Slope and Intercept**

View individual product and its full preview

06 **Interpolation and Extrapolation**

View individual product and its full preview

07 **Calculating Residuals**

View individual product and its full preview

08 **Residual Plots**

View individual product and its full preview

8 included resources | Complete resource previews follow this guide.

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Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Scatter Plots and Bivariate Data

Scatter Plots and Bivariate Data | A1-U10-P07

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for removed/added coordinates and updated ordered-pair multiset, axis assignment, labeled bounds/ticks, and role justification, axis labels and complete plotted ordered-pair multiset, qualifying complete ordered pairs and interpretation, missing coordinate or pair, with uniqueness/ambiguity justification and error diagnosis, exact removals/additions, and corrected multiset.

8 PDFs and a README; 188 buyer pages.

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

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Algebra 1

Scatter Plots and Bivariate Data

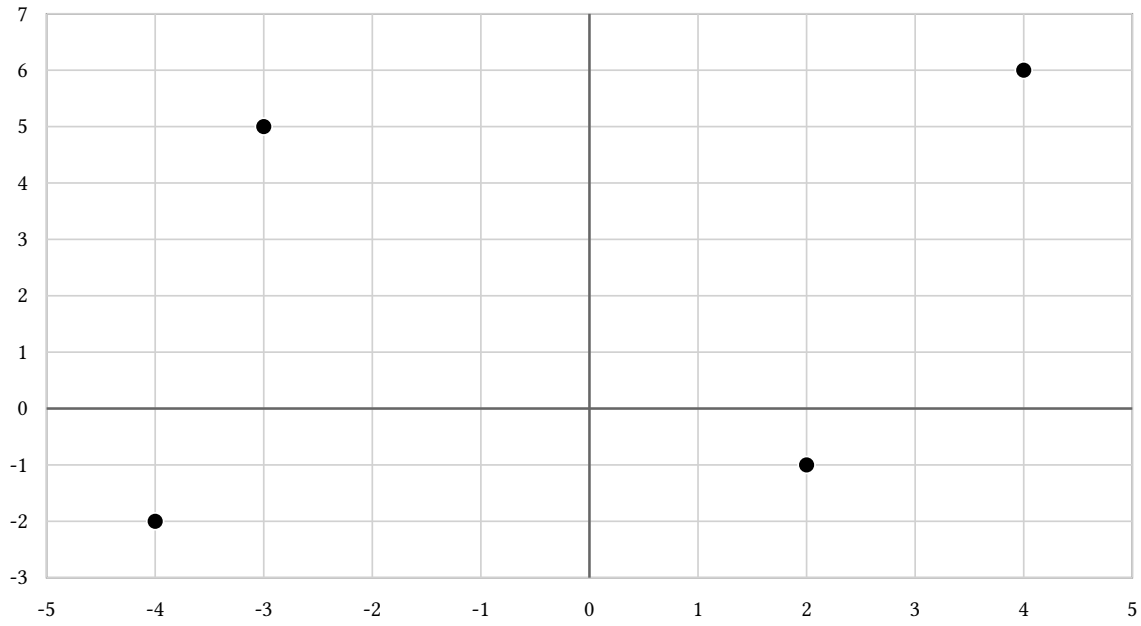
Name: _____ **Date:** _____ **Class:** _____

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

An exact scatter plot contains the points $(-4, -2)$; $(-3, 5)$; $(2, -1)$; $(4, 6)$. The horizontal axis is x change (units); the vertical axis is y change (units). Find the record with both coordinates negative. Return complete ordered pairs with units and preserve any stated multiplicity.

Given scatter plot

Vertical axis: y change (units)



Bank label: _____

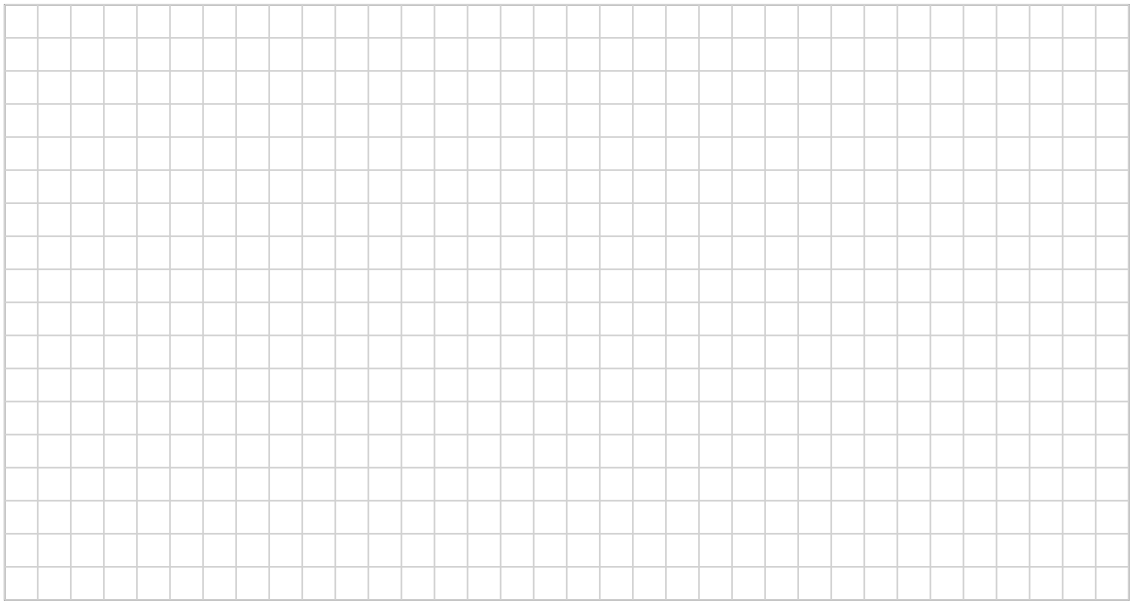
Algebra 1

Scatter Plots and Bivariate Data

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.

Three seedlings are measured. The paired table records age (days) and height (*cm*): A: $(1, 3)$, B: $(2, 5)$, C: $(3, 8)$. Put age on the horizontal axis and height on the vertical axis. Plot all three records and list the ordered pairs used.



Choose and label axes, bounds and uniform tick intervals.

Record	age (days)	height (cm)
A	1	3
B	2	5
C	3	8

Algebra 1

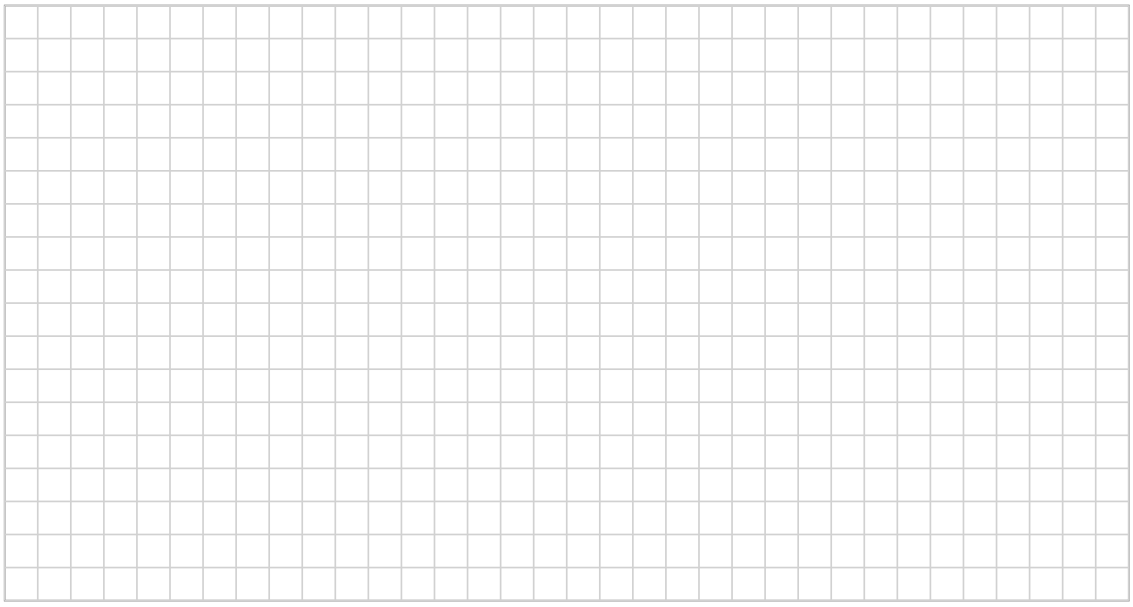
Scatter Plots and Bivariate Data

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: horizontal axis: input change (units); plot note: The origin has multiplicity 2, not one observation.; points: 0 and 0, 0 and 0, 1 and 2, 2 and 1; vertical axis: output change (units)

Study time is paired with a percentage. The paired table records study time (minutes) and accuracy (percent): A: $(15, 55)$, B: $(30, 72)$, C: $(45, 68)$, D: $(60, 88)$. Put study time on the horizontal axis and accuracy on the vertical axis. Label the vertical quantity as percent and retain the dip at 45 minutes.



Choose and label axes, bounds and uniform tick intervals.

Record	study time (minutes)	accuracy (percent)
A	15	55
B	30	72
C	45	68
D	60	88

Your response: _____

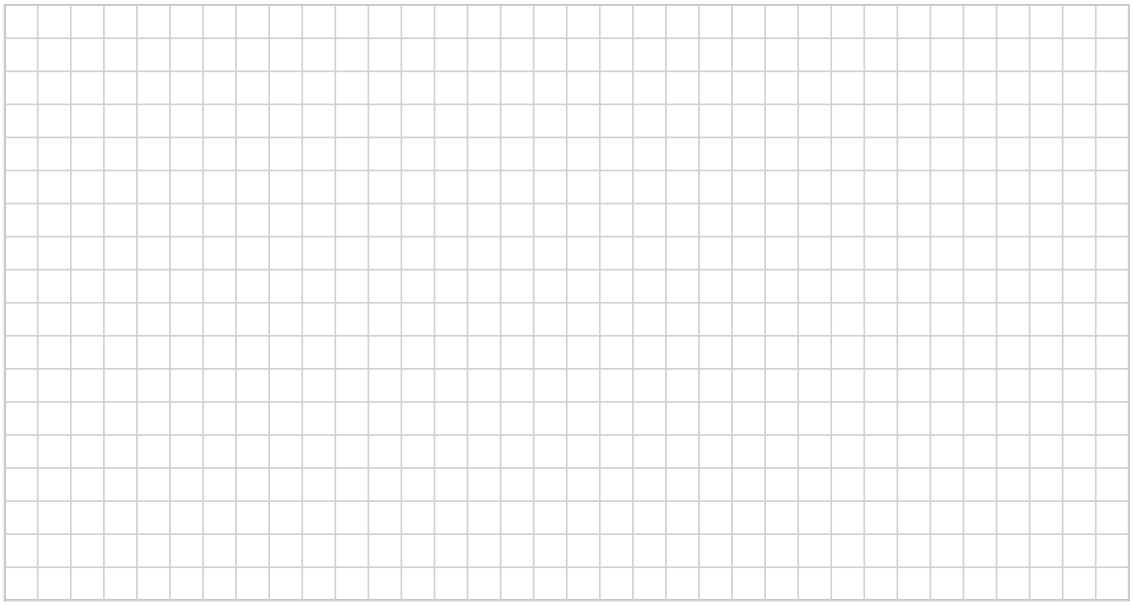
Algebra 1

Scatter Plots and Bivariate Data

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.

Dose is deliberately set before measuring response. The paired variables are dose (mg) with observed range 0 to 50, and response (points) with observed range 12 to 88. Investigation question: How does response vary as dose is changed? Choose horizontal and vertical variables, give explicit uniform axis bounds and tick intervals, and justify the role assignment.



Choose and label axes, bounds and uniform tick intervals.

Variable	Unit	Observed range
dose	mg	0 to 50
response	points	12 to 88

Scatter Plots and Bivariate Data

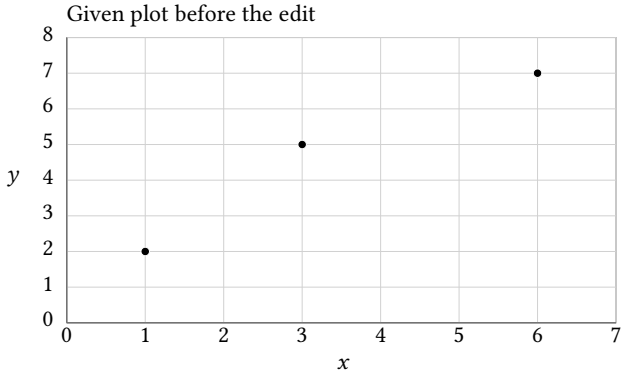
Full Worked Solutions - excerpt

Worked example

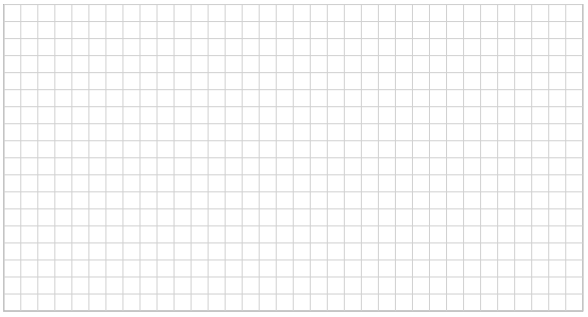
Problem. The current scatter plot contains the ordered-pair multiset $(1,2)$; $(3,5)$; $(6,7)$. A new observation has $x = 4$ and $y = 9$. Update the plot exactly, leaving every unaffected observation unchanged. Add it without connecting points.

Graph 1

Given plot before the edit



Graph 2



Choose and label axes, bounds and uniform tick intervals.

Answer. add: 4 and 9; after: 1 and 2, 3 and 5, 4 and 9, 6 and 7; note: Scatter points remain unconnected.; remove:

Explanation and check.

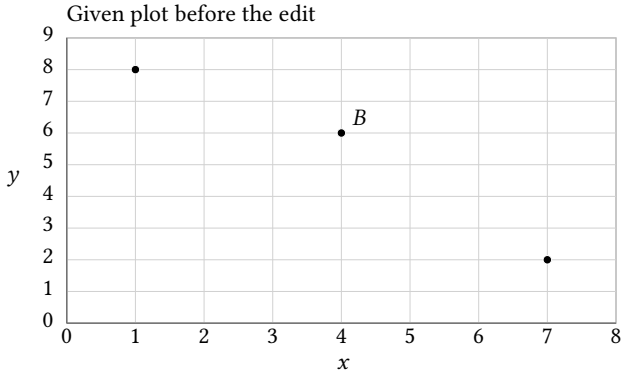
Remove no existing point; add $(4,9)$. The updated multiset is $(1,2)$; $(3,5)$; $(4,9)$; $(6,7)$. Scatter points remain unconnected.

Worked example

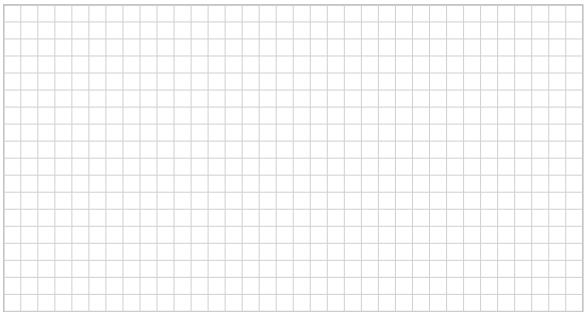
Problem. The current scatter plot contains the ordered-pair multiset $(1,8)$; $(4,6)$; $(7,2)$. Record B was transcribed as $(4,6)$; its source row is actually $(5,9)$. Update the plot exactly, leaving every unaffected observation unchanged. Treat this as one paired replacement, not two observations.

Graph 1

Given plot before the edit



Graph 2



Choose and label axes, bounds and uniform tick intervals.

Answer. add: 5 and 9; after: 1 and 8, 5 and 9, 7 and 2; note: One record moves in both coordinates.; remove: 4 and 6

Explanation and check.

Remove $(4,6)$; add $(5,9)$. The updated multiset is $(1,8)$; $(5,9)$; $(7,2)$. One record moves in both coordinates.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Correlation and Linear Association

Correlation and Linear Association | A1-U10-P08

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for evidence-based linear association statement.

8 PDFs and a README; 140 buyer pages.

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

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Algebra 1

Correlation and Linear Association

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.

Technology reports $r = 1.0$ for two nonconstant measurements. All points lie on a rising line. Interpret sign and magnitude as linear association, using context-calibrated language rather than a universal cutoff. State the exact implication. Bank label: _____	Technology reports $r = -1.0$ for two nonconstant measurements. All points lie on a falling line. Interpret sign and magnitude as linear association, using context-calibrated language rather than a universal cutoff. State the exact implication. Bank label: _____
Technology reports $r = 0.96$ for height and arm span in one sample. The scatter plot is a tight rising band. Interpret sign and magnitude as linear association, using context-calibrated language rather than a universal cutoff. Use ordinary descriptive language. Bank label: _____	Technology reports $r = -0.94$ for speed and travel time for a fixed route. The plot is a tight falling band. Interpret sign and magnitude as linear association, using context-calibrated language rather than a universal cutoff. Interpret the sign. Bank label: _____
Technology reports $r = 0.03$ for shoe size and quiz score. No curved pattern is visible. Interpret sign and magnitude as linear association, using context-calibrated language rather than a universal cutoff. Limit the conclusion to linear association. Bank label: _____	Technology reports $r = 0.58$ for practice hours and performance score. Points generally rise with noticeable scatter. Interpret sign and magnitude as linear association, using context-calibrated language rather than a universal cutoff. Avoid an absolute cutoff claim. Bank label: _____
Technology reports $r = -0.62$ for outside temperature and heating use. Points generally fall with scatter. Interpret sign and magnitude as linear association, using context-calibrated language rather than a universal cutoff. Use units only in context, not for r. Bank label: _____	Technology reports $r = 0.21$ for screen time and sleep duration. The upward tendency is faint. Interpret sign and magnitude as linear association, using context-calibrated language rather than a universal cutoff. State uncertainty descriptively. Bank label: _____

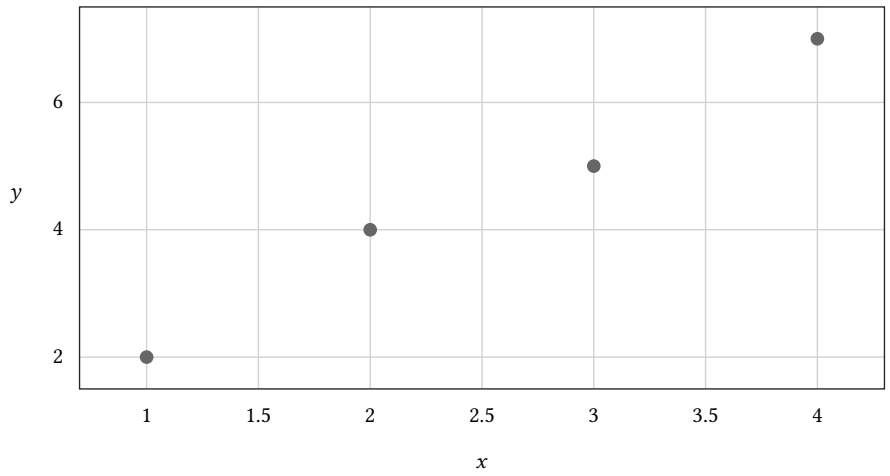
Algebra 1

Correlation and Linear Association

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.

An exact scatter plot contains $(1, 2)$; $(2, 4)$; $(3, 5)$; $(4, 7)$. Points rise left to right. Classify the visible linear direction and distinguish any nonlinear structure. Use the whole pattern.



Observation	Original x	Original y
1	1	2
2	2	4
3	3	5
4	4	7

Algebra 1

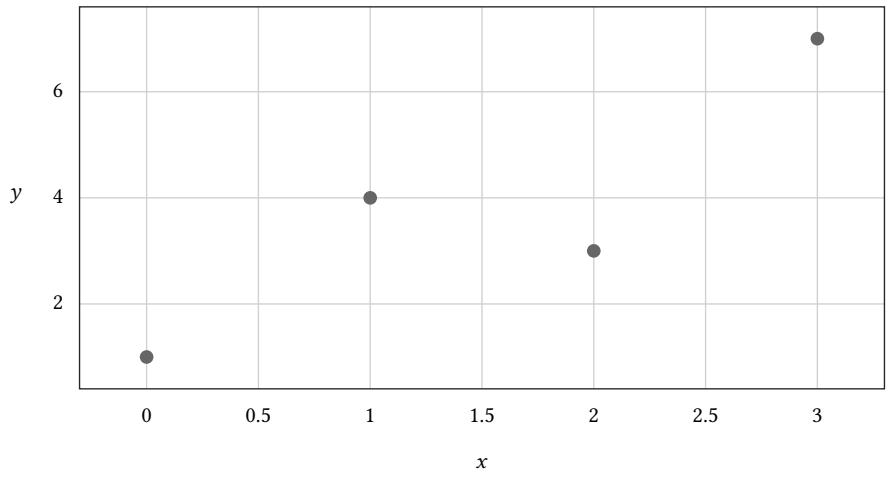
Correlation and Linear Association

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: plot a r: 0.88; plot b r: 0.88; qualification: Matching is not unique by value because both are intentionally equal.; reasoning: Translations preserve r exactly.

Two exact scatter plots are given. Plot A: $(0, 1)$; $(1, 4)$; $(2, 3)$; $(3, 7)$. Plot B: $(0, -1)$; $(1, -4)$; $(2, -3)$; $(3, -7)$. Candidate correlations are $0.88, -0.88$. B negates y. Match each plot to the compatible supplied r using direction, relative tightness, and any nonlinear limitation. Match.



Observation	Original x	Original y
1	0	1
2	1	4
3	2	3
4	3	7

Observation	Original x	Original y
1	0	−1
2	1	−4
3	2	−3
4	3	−7

Your response: _____

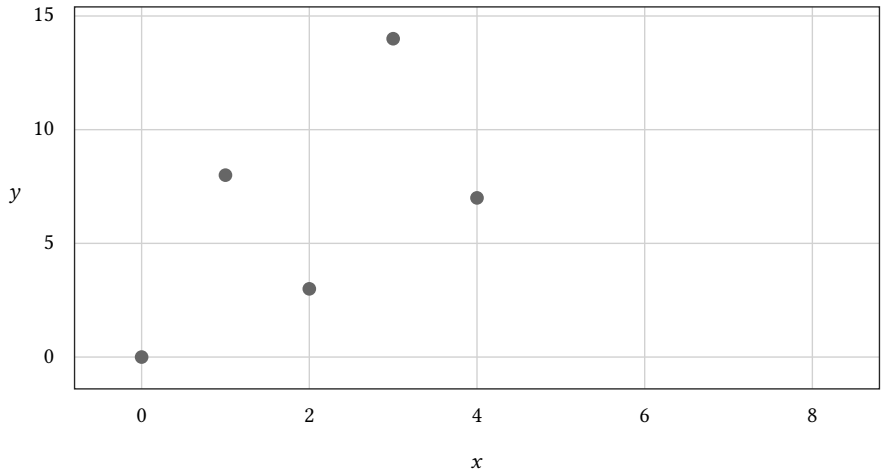
Algebra 1

Correlation and Linear Association

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.

Plot A uses the stated common scale and contains $(0,0)$; $(1,8)$; $(2,3)$; $(3,14)$; $(4,7)$. Plot B contains $(0,2)$; $(2,3)$; $(4,4)$; $(6,5)$; $(8,6)$. A is steeper but scattered; B is shallow and exact. Compare linear strength by closeness to a line, not by slope steepness or sign. Rank strength.



Observation	Original x	Original y
1	0	0
2	1	8
3	2	3
4	3	14
5	4	7

Observation	Original x	Original y
1	0	2
2	2	3
3	4	4
4	6	5
5	8	6

Correlation and Linear Association

Full Worked Solutions - excerpt

Worked example

Problem. A dataset has correlation $r = 0.69$. Interchange x and y, including their axis labels. Predict the new correlation and justify using affine transformation rules. Do not confuse swapping with negating.

Answer. effect: preserved; justification: Correlation is symmetric: $r(x, y) = r(y, x)$.; new r: 0.69; original r: 0.69

Explanation and check.

The new correlation is 0.69. Correlation is symmetric: $r(x, y) = r(y, x)$.

Worked example

Problem. A dataset has correlation $r = -0.33$. Use x_new= $x - 100$ and y_new= $y + 12$. Predict the new correlation and justify using affine transformation rules. Track two translations.

Answer. effect: preserved; justification: Translations of either or both variables preserve r.; new r: -0.33; original r: -0.33

Explanation and check.

The new correlation is -0.33. Translations of either or both variables preserve r.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Correlation vs Causation

Correlation vs Causation | A1-U10-P09

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for direction-by-direction timing assessment, comparative causal support and scoped conclusion, selected evidence with rival-specific predictions, classification with decisive language and scope, two explicit arrows and qualified rival explanation and evidence-limited rewrite and named overreach.

8 PDFs and a README; 57 buyer pages.

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

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Algebra 1

Correlation vs Causation

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.

Fictional study summary: In one sample, taller plants also had wider leaves. Statement: “Taller sampled plants tended to have wider leaves.” Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Do not add a mechanism. Bank label: _____	Fictional study summary: Two variables were observed at one time. Statement: “Increasing light causes leaf width to grow.” Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Focus on the verb. Bank label: _____
Fictional study summary: Fictional towns with more parks reported more walking. Statement: “Park count is associated with reported walking.” Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Classify. Bank label: _____	Fictional study summary: Students chose their own study times. Statement: “More study time leads to higher scores.” Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Classify logical content. Bank label: _____
Fictional study summary: A score is used to forecast a later fictional rating. Statement: “The first score helps predict the later rating.” Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Separate forecasting from intervention. Bank label: _____	Fictional study summary: Device settings and heat were merely recorded. Statement: “Turning the setting down reduces heat.” Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Classify. Bank label: _____
Fictional study summary: Two observed groups had different means. Statement: “Group A was higher on average than Group *B*.” Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Do not infer why. Bank label: _____	Fictional study summary: A fitted rule forecasts fictional sales from temperature. Statement: “If tomorrow is warmer, the model predicts more sales.” Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Classify model language. Bank label: _____

Algebra 1

Correlation vs Causation

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.

Fictional study summary: Users selected whether to enable a fictional filter. Statement: "The filter prevents errors." Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Classify.	Fictional study summary: Two trends rose over calendar time. Statement: "Trend X is responsible for Trend Y." Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Classify.
Fictional study summary: An observational chart is shown. Statement: "X explains the increase in Y." Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Interpret "explains" here.	Fictional study summary: Two fictional rates peak in the same weeks. Statement: "High X coincides with high Y." Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Classify.
Fictional study summary: Participants self-selected exposure. Statement: "Exposure raises the probability of outcome Y." Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Classify.	Fictional study summary: Two values are correlated. Statement: "Y is high because X is high." Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Classify.

Algebra 1

Correlation vs Causation

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: common cause: job-role composition; path to x: place more technical roles in remote arrangements.; path to y: give those roles higher pay bands.; rival explanation: role mix can shift both department averages.; status: plausible alternative, not established fact

Observed fictional association: step count is negatively associated with resting pulse Supplied third factor: baseline health and mobility. Explain a coherent common-cause alternative by stating how the factor could affect each measured variable. Do not claim this alternative is proven. State why measuring health would help.

Your response: _____

Incoming: common cause: team size; path to x: require more storage capacity.; path to y: produce more files through more members.; rival explanation: team size can explain the association.; status: plausible alternative, not established fact

Observed fictional association: departments with more remote hours have higher mean pay Supplied third factor: job-role composition. Explain a coherent common-cause alternative by stating how the factor could affect each measured variable. Do not claim this alternative is proven. Explain aggregation.

Your response: _____

Incoming: common cause: storm severity; path to x: increase needed repairs and spending.; path to y: increase the number of claims.; rival explanation: storm severity can drive both totals.; status: plausible alternative, not established fact

Fictional evidence: Earlier X predicts later Y and earlier Y predicts later X in separate comparisons. Candidate directions are $X \to Y$ and $Y \to X$. Assess which directions the timing excludes, permits, or supports, while keeping possibility separate from proof. Avoid declaring feedback proved.

Your response: _____

Incoming: classification: descriptive association; decisive feature: "Scores were higher after the event" describes a before-after temporal pattern, without saying that the event caused the difference.; supported scope: Concurrent changes could explain the difference.

Observed fictional association: fictional children with greater height read more pages Supplied third factor: age. Explain a coherent common-cause alternative by stating how the factor could affect each measured variable. Do not claim this alternative is proven. Do not say height causes reading.

Your response: _____

Incoming: limitation: r does not summarize the curve.; overreach: Zero linear correlation is called no relationship.; rewrite: The sample has zero linear correlation but a visible U-shaped relationship.

Fictional study: In a fictional simulation, agents selecting option X had lower Y. Headline: "Option X cures high Y." Rewrite the headline to preserve the observed result while removing unsupported causation or universality. Name the specific limitation. Keep scenario fictional and neutral.

Your response: _____

Incoming: limitation: Sampling concerns representation, not isolation of the exposure effect. No outcome direction or size was supplied.; overreach: Random sampling is confused with random assignment.; rewrite: A random-sample observational study examines self-selected X and Y; it does not establish that X causes Y.

Fictional study: An assigned package changes X, resources, and schedule together. Headline: "X alone caused Y." Rewrite the headline using only the supplied design facts, removing the unsupported attribution to X alone. Name the specific component-scope limitation. No outcome result or control comparison is supplied.

Your response: _____

Algebra 1

Correlation vs Causation

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.

Study A: participants chose condition X or control. Study B: participants were randomly assigned to X or control; procedures otherwise matched. Compare their support for the causal claim "X changes Y." by checking assignment, control, and concurrent differences. Choose stronger support.

Study A: a random sample chose its own condition. Study B: a convenience sample was randomly assigned to conditions. Compare their support for the causal claim "the condition causes Y in study participants." by checking assignment, control, and concurrent differences. Distinguish the two uses of random.

Study A: volunteers selected a high-effort program. Study B: eligible volunteers were randomly assigned high-effort or comparison conditions. Compare their support for the causal claim "the program raises scores." by checking assignment, control, and concurrent differences. Use motivation.

Study A: this year's X group is compared with last year's records. Study B: current X and control groups run simultaneously. Compare their support for the causal claim "X changes Y." by checking assignment, control, and concurrent differences. Use calendar effects.

Correlation vs Causation

Full Worked Solutions - excerpt

Worked example

Problem. Fictional study: Observational $r = -0.80$. Headline: "More X prevents Y." Rewrite the headline to preserve the observed result while removing unsupported causation or universality. Name the specific limitation. Keep sign.

Answer. limitation: The design does not show that increasing X reduces Y.; overreach: Negative association is called prevention.; rewrite: Higher X was associated with lower Y in the sample.

Explanation and check.

Overreach: Negative association is called prevention. Rewrite: Higher X was associated with lower Y in the sample. Limitation: The design does not show that increasing X reduces Y.

Worked example

Problem. Fictional study summary: In one sample, taller plants also had wider leaves. Statement: "Taller sampled plants tended to have wider leaves." Classify the statement as descriptive association, prediction, or causation, and identify the exact words or logical move that determine the class. Do not add a mechanism.

Answer. classification: descriptive association; decisive feature: "Tended to" reports *co*-variation only.; supported scope: It is limited to the sampled plants.

Explanation and check.

descriptive association. "Tended to" reports *co*-variation only. It is limited to the sampled plants.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Lines of Best Fit

Lines of Best Fit | A1-U10-P10

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for line-of-fit result with decisive evidence.

8 PDFs and a README; 158 buyer pages.

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

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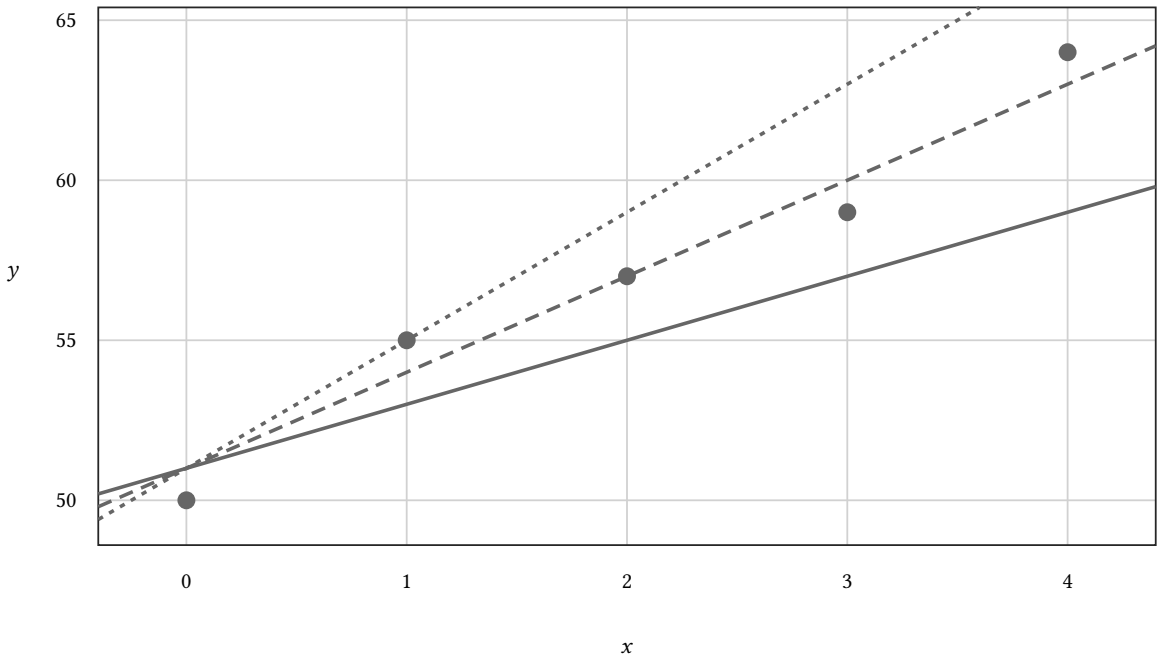
Algebra 1

Lines of Best Fit

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.

Paired study hours and quiz score data are $(0, 50)$; $(1, 55)$; $(2, 57)$; $(3, 59)$; $(4, 64)$. Three proposed summaries are A: y-hat $= 2x + 51$; B: y-hat $= 3x + 51$; C: y-hat $= 4x + 51$. Choose the line with the smallest sum of squared vertical errors. Show the criterion value for every candidate so a line matching one conspicuous point cannot win by inspection alone.



Observation	Original x	Original y
1	0	50
2	1	55
3	2	57
4	3	59
5	4	64

Bank label: _____

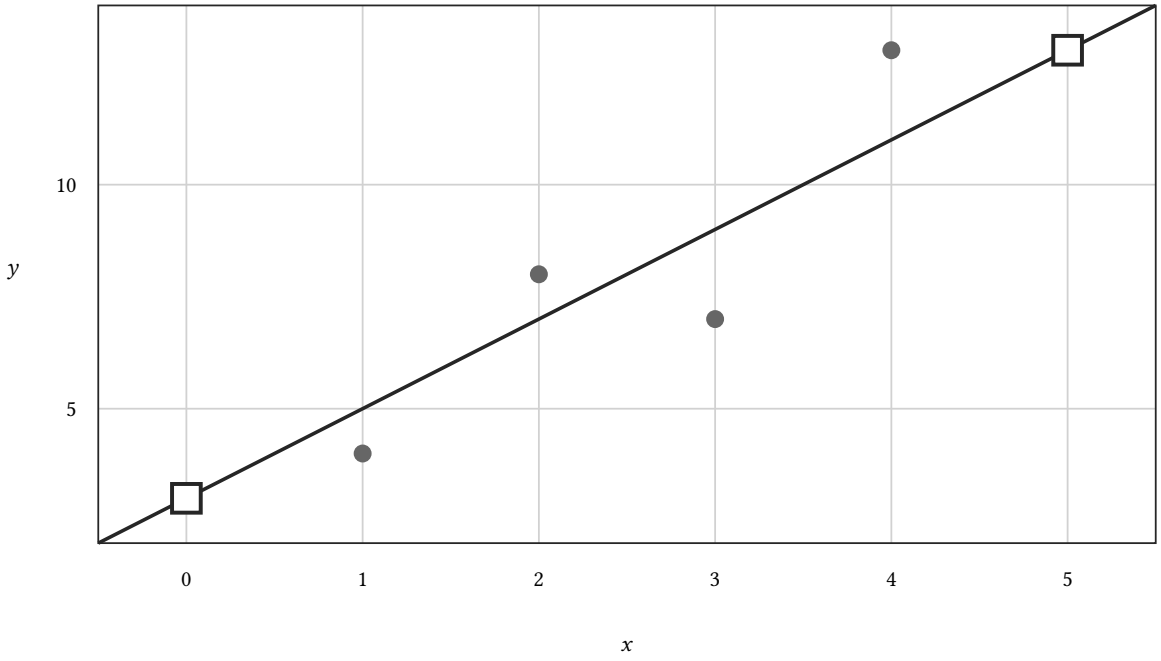
Algebra 1

Lines of Best Fit

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.

A scatter graph has observed points (1, 4); (2, 8); (3, 7); (4, 13). Two emphasized fit-line points are (0, 3); (5, 13); both marked points are construction handles, not observations. Use the emphasized points to write the selected fit equation. Then state how the two marker layers differ and check how many observations are within 2 vertical units of the line.



Observation	Original x	Original y
1	1	4
2	2	8
3	3	7
4	4	13

Fit marker	Original x	Original y
1	0	3
2	5	13

Algebra 1

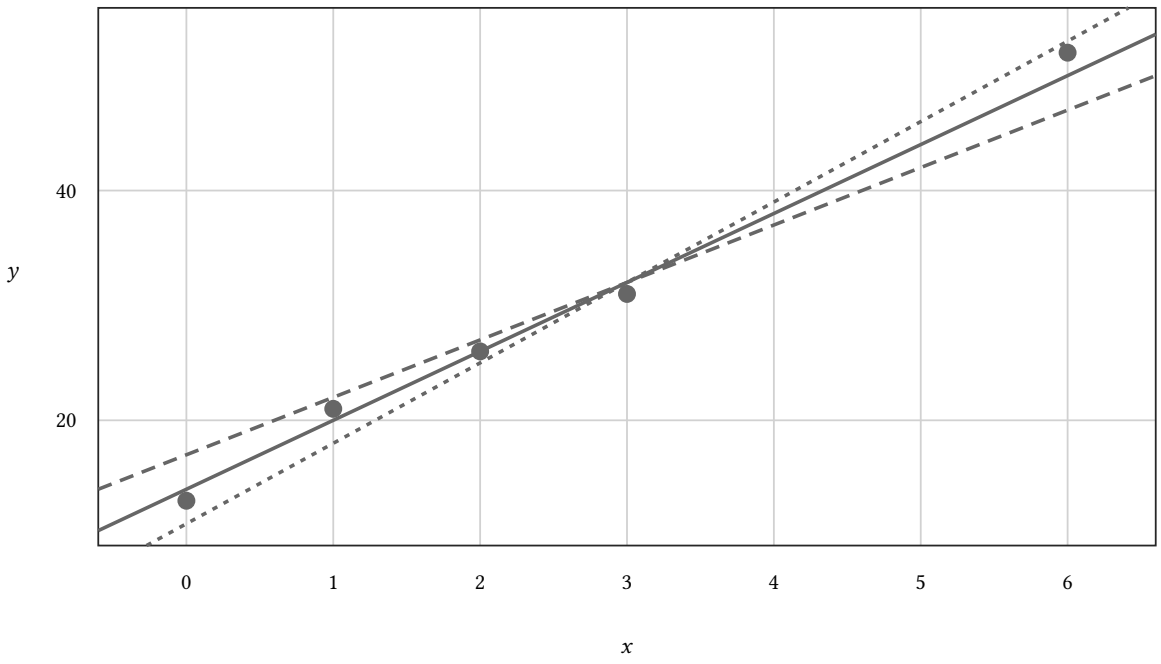
Lines of Best Fit

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.

START

Paired delivery stops and minutes data are $(0, 13)$; $(1, 21)$; $(2, 26)$; $(3, 31)$; $(6, 52)$. Three proposed summaries are A: y-hat $= 6x + 14$; B: y-hat $= 5x + 17$; C: y-hat $= 7x + 11$. Choose the line with the smallest sum of absolute vertical errors. Show the criterion value for every candidate so a line matching one conspicuous point cannot win by inspection alone.



Observation	Original x	Original y
1	0	13
2	1	21
3	2	26
4	3	31
5	6	52

Your response: _____

Algebra 1

Lines of Best Fit

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 least-squares summary changes after this documented data edit: a far-right point lying near the old trend is added. The supplied fit before the edit is y-hat $= 2x + 5$; after the edit it is y-hat $= 2.2x + 4.8$. Compute the slope and intercept changes, then explain the direction using the edited point's horizontal leverage and vertical position. Do not claim an exact coefficient from geometry alone—the outputs are supplied.

A least-squares summary changes after this documented data edit: the largest-x point is moved well above the old line. The supplied fit before the edit is y-hat $= -x + 30$; after the edit it is y-hat $= -0.6x + 27$. Compute the slope and intercept changes, then explain the direction using the edited point's horizontal leverage and vertical position. Do not claim an exact coefficient from geometry alone—the outputs are supplied.

A least-squares summary changes after this documented data edit: a point near mean x is raised by 8 units. The supplied fit before the edit is y-hat $= 3x + 4$; after the edit it is y-hat $= 3x + 5$. Compute the slope and intercept changes, then explain the direction using the edited point's horizontal leverage and vertical position. Do not claim an exact coefficient from geometry alone—the outputs are supplied.

A least-squares summary changes after this documented data edit: a new far-right observation falls below the former positive trend. The supplied fit before the edit is y-hat $= 4x + 2$; after the edit it is y-hat $= 3.2x + 3.6$. Compute the slope and intercept changes, then explain the direction using the edited point's horizontal leverage and vertical position. Do not claim an exact coefficient from geometry alone—the outputs are supplied.

Lines of Best Fit

Full Worked Solutions - excerpt

Worked example

Problem. Audit this fictional fitting work: Output uses y-hat = $a + bx$ with $a = 18$ and $b = -3$, yet a student writes y-hat = $18x - 3$. Identify the precise construction or model-choice error, repair the procedure or equation, and name the evidence that must be reconsidered. A generic instruction to 'draw a better line' is insufficient.

Answer. fault: Output uses y-hat = $a + bx$ with $a = 18$ and $b = -3$, yet a student writes y-hat = $18x - 3$.; repair: Read the displayed convention: a is intercept and b is slope, so the correction is y-hat = $18 - 3x$.

Explanation and check.

Fault: Output uses y-hat = $a + bx$ with $a = 18$ and $b = -3$, yet a student writes y-hat = $18x - 3$. Repair: Read the displayed convention: a is intercept and b is slope, so the correction is y-hat = $18 - 3x$.

Worked example

Problem. Audit this fictional fitting work: A downward cloud is modeled with y-hat = $2x + 9$ because the student used absolute rise and run. Identify the precise construction or model-choice error, repair the procedure or equation, and name the evidence that must be reconsidered. A generic instruction to 'draw a better line' is insufficient.

Answer. fault: A downward cloud is modeled with y-hat = $2x + 9$ because the student used absolute rise and run.; repair: Preserve signed rise: the fitted slope must be negative, then recompute its intercept from actual fit-line points.

Explanation and check.

Fault: A downward cloud is modeled with y-hat = $2x + 9$ because the student used absolute rise and run. Repair: Preserve signed rise: the fitted slope must be negative, then recompute its intercept from actual fit-line points.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Interpreting Regression Slope and Intercept

Interpreting Regression Slope and Intercept | A1-U10-P11

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for coefficient interpretation with units and model limits.

8 PDFs and a README; 82 buyer pages.

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

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Algebra 1

Interpreting Regression Slope and Intercept

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 fitted line has slope 4, measured in score points per unit of practice sessions. Compare input 3 to input 9. Find the signed fitted response change, include units, and explain why the intercept is unnecessary for this difference.

Original supplied quantity	Given value
Slope	4
Input start	3
Input end	9
Input unit	practice sessions
Response unit	score points

Bank label: _____

A fitted line has slope −3, measured in demand units per unit of temperature degrees. Compare input 20 to input 14. Find the signed fitted response change, include units, and explain why the intercept is unnecessary for this difference.

Original supplied quantity	Given value
Slope	−3
Input start	20
Input end	14
Input unit	temperature degrees
Response unit	demand units

Bank label: _____

A fitted line has slope 12, measured in kilometers per unit of hours. Compare input 1.5 to input 3.75. Find the signed fitted response change, include units, and explain why the intercept is unnecessary for this difference.

Original supplied quantity	Given value
Slope	12
Input start	1.5
Input end	3.75
Input unit	hours
Response unit	kilometers

Bank label: _____

A fitted line has slope −8, measured in light units per unit of meters of depth. Compare input 2 to input 7. Find the signed fitted response change, include units, and explain why the intercept is unnecessary for this difference.

Original supplied quantity	Given value
Slope	−8
Input start	2
Input end	7
Input unit	meters of depth
Response unit	light units

Bank label: _____

Algebra 1

Interpreting Regression Slope and Intercept

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 fitted data model is y-hat = $3x + 4$, where x measures weeks and y-hat measures centimeters of fitted height. Interpret the slope's sign, magnitude, and compound units using model language. Do not turn an association into an exact or causal rule.

Original supplied quantity	Given value
Model	y-hat = $3x + 4$
Input unit	weeks
Response unit	centimeters of fitted height

A fitted data model is y-hat = $-2x + 90$, where x measures minutes and y-hat measures degrees Celsius of fitted temperature. Interpret the slope's sign, magnitude, and compound units using model language. Do not turn an association into an exact or causal rule.

Original supplied quantity	Given value
Model	y-hat = $-2x + 90$
Input unit	minutes
Response unit	degrees Celsius of fitted temperature

A fitted data model is y-hat = 6, where x measures machine hours and y-hat measures fitted defects per batch. Interpret the slope's sign, magnitude, and compound units using model language. Do not turn an association into an exact or causal rule.

Original supplied quantity	Given value
Model	y-hat = 6
Input unit	machine hours
Response unit	fitted defects per batch

A fitted data model is y-hat = $5x + 48$, where x measures practice sessions and y-hat measures fitted words per minute. Interpret the slope's sign, magnitude, and compound units using model language. Do not turn an association into an exact or causal rule.

Original supplied quantity	Given value
Model	y-hat = $5x + 48$
Input unit	practice sessions
Response unit	fitted words per minute

Algebra 1

Interpreting Regression Slope and Intercept

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.

START

The old fitted model for load response is y_old-hat = $4x$_old + 20. One new input unit (trips) equals 1 old input units, and one new response unit (kilograms) equals 2.205 old response units. Rewrite the same fit in X and Y, then interpret why the coefficient numbers changed without changing the underlying relationship.

Original supplied quantity	Given value
Old model	y_old-hat = $4x$_old + 20
Old input per new	1
Old output per new	2.205
New input unit	trips
New output unit	kilograms

Your response: _____

Incoming: new intercept: 100; new model: Y-hat = $-0.05X + 100$; new slope: -0.05; reason: One centimeter equals 0.01 old meter, so the per-centimeter slope is smaller.

The old fitted model for value is y_old-hat = $-3x$_old + 28. One new input unit (years) equals 1 old input units, and one new response unit (dollars) equals 0.001 old response units. Rewrite the same fit in X and Y, then interpret why the coefficient numbers changed without changing the underlying relationship.

Original supplied quantity	Given value
Old model	y_old-hat = $-3x$_old + 28
Old input per new	1
Old output per new	0.001
New input unit	years
New output unit	dollars

Your response: _____

Incoming: New intercept: 10; New model: y-hat = $5t + 10$; Slope: 5. Changing the day label translates the origin but does not alter daily rate. If S is the original supported input set, the supported set for t is $S - (1000)$. An original interval $[L, U]$ becomes $[L - (1000), U - (1000)]$. The same observations are used; this adds no extrapolation.

A fitted model uses hours after midnight: y-hat = $-4x + 70$. Define $t = x - 12$, so t measures hours after noon. Rewrite the line in t, identify the new intercept's contextual reference, and state what happens to the slope and supported input range.

Original supplied quantity	Given value
Old model	y-hat = $-4x + 70$
Reference old x	12
New input	hours after noon

Your response: _____

Incoming: New intercept: 52; New model: y-hat = $4t + 52$; Slope: 4. The baseline moves to age 10, so the intercept becomes the fitted age-10 response. If S is the original supported input set, the supported set for t is $S - (10)$. An original interval $[L, U]$ becomes $[L - (10), U - (10)]$. The same observations are used; this adds no extrapolation.

A fitted model uses calendar day: y-hat = $5x - 4990$. Define $t = x - 1000$, so t measures days after launch day 1000. Rewrite the line in t, identify the new intercept's contextual reference, and state what happens to the slope and supported input range.

Original supplied quantity	Given value
Old model	y-hat = $5x - 4990$
Reference old x	1000
New input	days after launch day 1000

Your response: _____

Algebra 1

Interpreting Regression Slope and Intercept

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.

Two fitted models must be compared. A is $3 cm/$ week and B is $5 cm/$ week; compare height rates in $cm/$ week. Decide whether the rates are directly comparable, perform any stated conversion, and do not confuse a larger rate with stronger correlation.

Original supplied quantity	Given value
Model a reported slope	3
Model b reported slope	5
Reported units	A is $3 cm$/week and B is $5 cm$/week; compare height rates in cm/week.

Two fitted models must be compared. A is -4 and B is -2 thousand dollars/year; compare rates and decline magnitudes. Decide whether the rates are directly comparable, perform any stated conversion, and do not confuse a larger rate with stronger correlation.

Original supplied quantity	Given value
Model a reported slope	-4
Model b reported slope	-2
Reported units	A is -4 and B is -2 thousand dollars/year; compare rates and decline magnitudes.

Interpreting Regression Slope and Intercept

Full Worked Solutions - excerpt

Worked example

Problem. Audit this parameter interpretation: For y-hat = $4x + 18$, a report calls 4 the initial fitted value. Identify whether the error concerns coefficient role, units, domain, modeled wording, or causation, and replace it with a context-safe statement.

Original supplied quantity	Given value
Faulty interpretation	For y-hat = $4x + 18$, a report calls 4 the initial fitted value.

Answer. fault: For y-hat = $4x + 18$, a report calls 4 the initial fitted value.; repair: The intercept 18 is the fitted value at $x = 0$; 4 is the fitted response change per input unit.

Explanation and check.

The interpretation fails its coefficient audit. The intercept 18 is the fitted value at $x = 0$; 4 is the fitted response change per input unit.

Worked example

Problem. Audit this parameter interpretation: A slope of 6 score points per hour is described as 6 hours per score point. Identify whether the error concerns coefficient role, units, domain, modeled wording, or causation, and replace it with a context-safe statement.

Original supplied quantity	Given value
Faulty interpretation	A slope of 6 score points per hour is described as 6 hours per score point.

Answer. fault: A slope of 6 score points per hour is described as 6 hours per score point.; repair: Keep response over explanatory units: 6 score points per hour.

Explanation and check.

The interpretation fails its coefficient audit. Keep response over explanatory units: 6 score points per hour.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Interpolation and Extrapolation

Interpolation and Extrapolation | A1-U10-P12

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for prediction with evidential and contextual qualification.

8 PDFs and a README; 57 buyer pages.

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

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Algebra 1

Interpolation and Extrapolation

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 fitted linear model is y-hat = $3x + 5$; x is measured in weeks, y-hat in centimeters, and observed inputs span 0 to 10. Predict at $x = 10$, report according to nearest centimeter, and identify whether the result is modeled or observed and whether the input is interpolation or extrapolation. Bank label: _____	The fitted linear model is y-hat = $-2x + 78$; x is measured in minutes, y-hat in degrees Celsius, and observed inputs span 0 to 15. Predict at $x = 9$, report according to nearest degree, and identify whether the result is modeled or observed and whether the input is interpolation or extrapolation. Bank label: _____
The fitted linear model is y-hat = 14; x is measured in filter setting, y-hat in clarity units, and observed inputs span 1 to 9. Predict at $x = 7$, report according to nearest unit, and identify whether the result is modeled or observed and whether the input is interpolation or extrapolation. Bank label: _____	The fitted linear model is y-hat = $1.5x + 4$; x is measured in hours, y-hat in kilometers, and observed inputs span 0 to 8. Predict at $x = 4.5$, report according to nearest tenth, and identify whether the result is modeled or observed and whether the input is interpolation or extrapolation. Bank label: _____
The fitted linear model is y-hat = $5x - 3$; x is measured in liters, y-hat in yield kilograms, and observed inputs span 1 to 8. Predict at $x = 4$, report according to nearest kilogram, and identify whether the result is modeled or observed and whether the input is interpolation or extrapolation. Bank label: _____	The fitted linear model is y-hat = $1.4x + 8$; x is measured in kilometers, y-hat in fuel liters, and observed inputs span 0 to 10. Predict at $x = 5$, report according to nearest tenth, and identify whether the result is modeled or observed and whether the input is interpolation or extrapolation. Bank label: _____
The fitted linear model is y-hat = $4x + 11$; x is measured in advertising blocks, y-hat in expected orders, and observed inputs span 0 to 12. Predict at $x = 8$, report according to nearest whole expected order, and identify whether the result is modeled or observed and whether the input is interpolation or extrapolation. Bank label: _____	The fitted linear model is y-hat = $-3x + 20$; x is measured in signed position meters, y-hat in signal units, and observed inputs span -5 to 5. Predict at $x = -2$, report according to nearest unit, and identify whether the result is modeled or observed and whether the input is interpolation or extrapolation. Bank label: _____

Algebra 1

Interpolation and Extrapolation

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.

The fitted linear model is y-hat $= 2x + 4$; x is measured in miles, y-hat in dollars, and observed inputs span 0 to 12. Predict at $x = 6$, report according to nearest cent, and identify whether the result is modeled or observed and whether the input is interpolation or extrapolation.	A table has four evenly spread observations and asks about an unlisted middle input. Observed explanatory inputs are $1, 3, 5, 7$; the model is requested at $x = 4$. Classify from actual observations and qualify gaps or endpoints.
The request uses the first recorded input in a four-row table. Observed explanatory inputs are $0, 2, 6, 9$; the model is requested at $x = 0$. Classify from actual observations and qualify gaps or endpoints.	The target matches the last recorded input rather than extending past it. Observed explanatory inputs are $2, 4, 8, 10$; the model is requested at $x = 10$. Classify from actual observations and qualify gaps or endpoints.
A requested input sits one unit above every measured setting. Observed explanatory inputs are $1, 2, 5, 8$; the model is requested at $x = 9$. Classify from actual observations and qualify gaps or endpoints.	The model is queried two units below the earliest recorded setting. Observed explanatory inputs are $3, 5, 7, 11$; the model is requested at $x = 1$. Classify from actual observations and qualify gaps or endpoints.

Algebra 1

Interpolation and Extrapolation

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: reason: Currency reporting uses cents and ordinary rounding.; report: $27.39

A fitted model produces 12.746 cm. The output represents measured length estimate. Reporting rule: nearest tenth centimeter. Choose the defensible final report and explain why calculator digits, discreteness, or threshold logic require that form.

Your response: _____

Incoming: estimated input: 5; reason: Solving $4x + 10 = 30$ gives $x = 5$, inside the observed range.; status: supported

A fractional slope must be undone before checking support. The fitted linear model is y-hat = $1.5x + 4$, observed for inputs 0 through 8. Estimate the input for fitted response 13, then check uniqueness, support, and feasibility.

Your response: _____

Incoming: estimated input: 3.5; reason: The solution x = 3.5 is not a whole number of machines.; status: contextually inadmissible

Elapsed time is continuous, so a fractional inverse can be meaningful. The fitted linear model is y-hat = $8x + 2$, observed for inputs 0 through 4. Estimate the input for fitted response 17, then check uniqueness, support, and feasibility.

Your response: _____

Incoming: estimated input: 12; reason: The exact inverse x = 12 lies beyond the observed range; report the estimate with a support warning.; status: extrapolated input

A continuous inverse falls between two feasible machine counts. The fitted linear model is y-hat = $5x + 8$, observed for inputs 0 through 10. Estimate the input for fitted response 40, then check uniqueness, support, and feasibility.

Your response: _____

Incoming: estimated input: $\frac{29}{7}$; reason: The exact solution x = $\frac{29}{7}$ lies within the observed range.; status: supported

The explanatory coordinate explicitly permits negative positions. The fitted linear model is y-hat = $-4x + 10$, observed for inputs -5 through 5. Estimate the input for fitted response 22, then check uniqueness, support, and feasibility.

Your response: _____

START

The fitted exponential model is y-hat = $40(0.75)^x$; x is measured in cycles, y-hat in remaining capacity percent, and observed inputs span 0 to 5. Predict at $x = 8$, report according to nearest tenth percent, and identify whether the result is modeled or observed and whether the input is interpolation or extrapolation.

Your response: _____

Algebra 1

Interpolation and Extrapolation

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 fitted model is y-hat = $3x + 10$, and a request uses $x = -2$. Context restriction: participants must be nonnegative whole numbers. Compute the algebraic model value, then decide whether it is a usable contextual prediction; if not, name the exact input or output restriction that fails.

The fitted model is y-hat = $4x + 12$, and a request uses $x = -3$. Context restriction: signed positions from -5 to 5 are allowed. Compute the algebraic model value, then decide whether it is a usable contextual prediction; if not, name the exact input or output restriction that fails.

The fitted model is y-hat = $\frac{1}{10}x + 0.6$, and a request uses $x = 5$. Context restriction: probability outputs must lie from 0 to 1. Compute the algebraic model value, then decide whether it is a usable contextual prediction; if not, name the exact input or output restriction that fails.

The fitted model is y-hat = $-\frac{1}{5}x + 0.5$, and a request uses $x = 4$. Context restriction: probability outputs must lie from 0 to 1. Compute the algebraic model value, then decide whether it is a usable contextual prediction; if not, name the exact input or output restriction that fails.

Interpolation and Extrapolation

Full Worked Solutions - excerpt

Worked example

Problem. A fitted model produces 18.64 people. The output represents expected attendance. Reporting rule: nearest tenth. Choose the defensible final report and explain why calculator digits, discreteness, or threshold logic require that form.

Answer. reason: A mean count may be fractional, so do not force it to an individual count.; report: 18.6 people expected

Explanation and check.

Report: 18.6 people expected. A mean count may be fractional, so do not force it to an individual count.

Worked example

Problem. A score target is sought from a positively sloped practice model. The fitted linear model is y-hat $= 4x + 10$, observed for inputs 0 through 10. Estimate the input for fitted response 30, then check uniqueness, support, and feasibility.

Answer. estimated input: 5; reason: Solving $4x + 10 = 30$ gives $x = 5$, inside the observed range.; status: supported

Explanation and check.

Reverse use gives input 5. Status: supported. Solving $4x + 10 = 30$ gives $x = 5$, inside the observed range.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Calculating Residuals

Calculating Residuals | A1-U10-P13

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for signed residual with response units and evidence.

8 PDFs and a README; 100 buyer pages.

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

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Algebra 1

Calculating Residuals

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 negative input maps to a positive prediction. Using residual = observed - predicted, evaluate y-hat = $-2x + 12$ at $x = -4$ for observed $y = 18$. Report the signed residual in units and state whether the point is above, below, or on the fit.

Original supplied quantity	Given value
Model	y-hat = $-2x + 12$
X	-4
Observed y	18
Response unit	units

Bank label: _____

An exact fractional fit is compared with a decimal observation. Using residual = observed - predicted, evaluate y-hat = $\frac{7}{3}x + 5$ at $x = 4$ for observed $y = 14.6$. Report the signed residual in units and state whether the point is above, below, or on the fit.

Original supplied quantity	Given value
Model	y-hat = $\frac{7}{3}x + 5$
X	4
Observed y	14.6
Response unit	units

Bank label: _____

A supplied quadratic fit gives predicted 21 while the observation is 25. Using residual = observed - predicted, evaluate y-hat = 21 at $x = 6$ for observed $y = 25$. Report the signed residual in units and state whether the point is above, below, or on the fit.

Original supplied quantity	Given value
Model	y-hat = 21
X	6
Observed y	25
Response unit	units

Bank label: _____

A supplied exponential fit gives predicted 32 and the observation is 28. Using residual = observed - predicted, evaluate y-hat = 32 at $x = 5$ for observed $y = 28$. Report the signed residual in units and state whether the point is above, below, or on the fit.

Original supplied quantity	Given value
Model	y-hat = 32
X	5
Observed y	28
Response unit	units

Bank label: _____

Algebra 1

Calculating Residuals

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 plant-height row lies above a rising fit. Using residual = observed - predicted, evaluate y-hat = $2x + 5$ at $x = 3$ for observed $y = 13$. Report the signed residual in centimeters and state whether the point is above, below, or on the fit.

Original supplied quantity	Given value
Model	y-hat = $2x + 5$
X	3
Observed y	13
Response unit	centimeters

A fare observation lies below its fitted line. Using residual = observed - predicted, evaluate y-hat = $3x + 4$ at $x = 2$ for observed $y = 8$. Report the signed residual in dollars and state whether the point is above, below, or on the fit.

Original supplied quantity	Given value
Model	y-hat = $3x + 4$
X	2
Observed y	8
Response unit	dollars

A sensor reading lands exactly on a horizontal fit. Using residual = observed - predicted, evaluate y-hat = 9 at $x = 5$ for observed $y = 9$. Report the signed residual in sensor units and state whether the point is above, below, or on the fit.

Original supplied quantity	Given value
Model	y-hat = 9
X	5
Observed y	9
Response unit	sensor units

A resale value exceeds a decreasing model. Using residual = observed - predicted, evaluate y-hat = $-4x + 40$ at $x = 6$ for observed $y = 18$. Report the signed residual in thousand dollars and state whether the point is above, below, or on the fit.

Original supplied quantity	Given value
Model	y-hat = $-4x + 40$
X	6
Observed y	18
Response unit	thousand dollars

Algebra 1

Calculating Residuals

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: 19.05

Response and residual use percentage points. Under e =observed-predicted, the known values are observed=missing, predicted=72, residual=6 percentage points. Recover the missing quantity and verify by subtraction.

Original supplied quantity	Given value
Observed	missing
Predicted	72
Residual	6
Response unit	percentage points

Your response: _____

Incoming: 9

Rounded quantities make the recovered fit approximate. Under e =observed-predicted, the known values are observed=12.9, predicted=missing, residual=−0.37 units. Recover the missing quantity and verify by subtraction.

Original supplied quantity	Given value
Observed	12.9
Predicted	missing
Residual	−0.37
Response unit	units

Your response: _____

Incoming: 23

A negative residual places the missing observation below prediction. Under e =observed-predicted, the known values are observed=missing, predicted=24, residual=−7 units. Recover the missing quantity and verify by subtraction.

Original supplied quantity	Given value
Observed	missing
Predicted	24
Residual	−7
Response unit	units

Your response: _____

START

Recover an observation from a positive residual and prediction. Under e =observed-predicted, the known values are observed=missing, predicted=18, residual=5 units. Recover the missing quantity and verify by subtraction.

Original supplied quantity	Given value
Observed	missing
Predicted	18
Residual	5
Response unit	units

Your response: _____

Algebra 1

Calculating Residuals

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.

At $x = 4$, observed $y = 25$ and residual 3 for y-hat$= mx + 5$. Use the residual identity first, then decide whether the named model parameter is identified by this one row.

Original supplied quantity	Given value
X	4
Observed	25
Residual	3
Unknown parameter	slope
Known parameter	5

At $x = 6$, observed $y = 20$ and residual -2 for y-hat$= 3x + b$. Use the residual identity first, then decide whether the named model parameter is identified by this one row.

Original supplied quantity	Given value
X	6
Observed	20
Residual	-2
Unknown parameter	intercept
Known parameter	3

Calculating Residuals

Full Worked Solutions - excerpt

Worked example

Problem. The two reported errors use dollars and minutes. Residuals are $3, 4$. Compare absolute sizes and the relevant aggregate; explain what signed cancellation can or cannot show.

Original supplied quantity	Given value
Residuals	$(3, 4)$

Answer. conclusion: not directly comparable; reason: Three dollars and four minutes require normalization or a stated metric.

Explanation and check.

Conclusion: not directly comparable. Three dollars and four minutes require normalization or a stated metric.

Worked example

Problem. Audit this residual work: A rounded predicted value is used to claim an exact residual. Identify the first invalid step and repair the calculation or interpretation using $e =$ observed-predicted and vertical response units.

Original supplied quantity	Given value
Worked claim	A rounded predicted value is used to claim an exact residual.

Answer. repair: Label the residual approximate unless the unrounded prediction is available.

Explanation and check.

Correction: Label the residual approximate unless the unrounded prediction is available.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Residual Plots

Residual Plots | A1-U10-P14

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for global residual-plot diagnostic with exact evidence.

8 PDFs and a README; 199 buyer pages.

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

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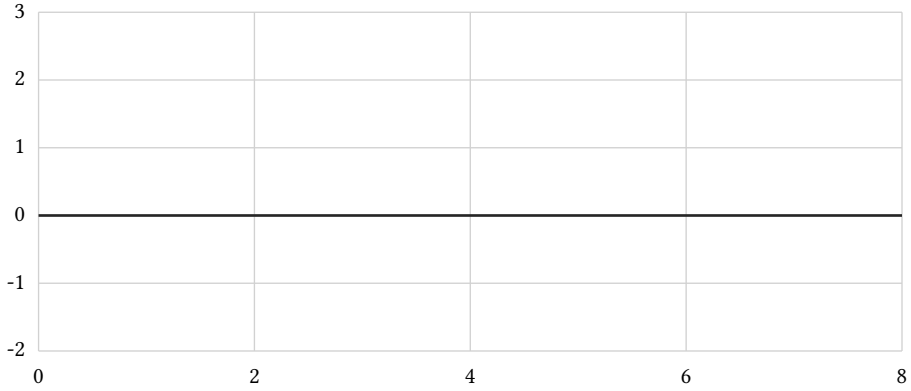
Algebra 1

Residual Plots

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.

Computing the table reveals positive ends and negative middle residuals. Plot the exact residual points $(0, 3)$; $(2, 0)$; $(4, -2)$; $(6, 0)$; $(8, 3)$ against the original x-values, include a horizontal $e = 0$ reference, and state the residual-axis units are response-error units.



Residual points	(0, 3), (2, 0), (4, −2), (6, 0), (8, 3)
Zero reference	Yes
Axis roles	Horizontal: original explanatory input Vertical: observed minus predicted response

Bank label: _____

Algebra 1

Residual Plots

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.

Exact residual coordinates are $(0, 4)$; $(1, 1)$; $(2, -3)$; $(3, 1)$; $(4, 4)$ with zero reference $e = 0$. Decide whether there is U-shaped, inverted-U, other systematic structure, or no clear curvature; use sign runs rather than only the largest point.

Residual points	(0, 4), (1, 1), (2, −3), (3, 1), (4, 4)
Zero reference	Yes
Model provenance	Residual coordinates supplied for analysis.

Algebra 1

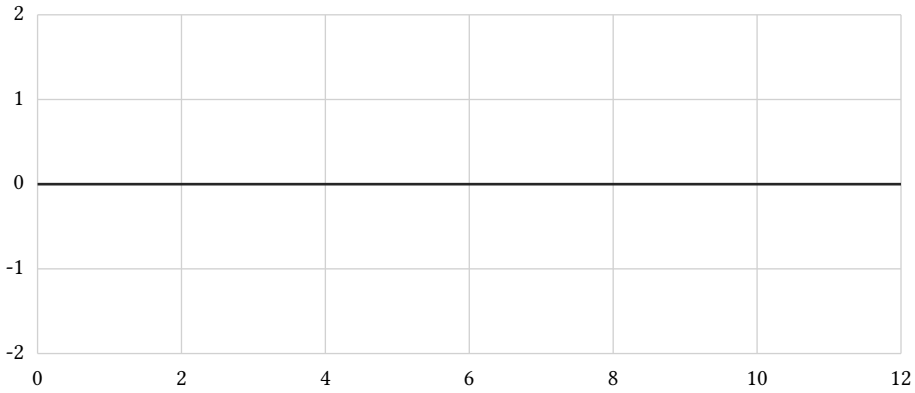
Residual Plots

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: points: (1, 1), (3, 2), (3, −2), (6, −1); zero reference: e = 0

Input spacing is strongly uneven. Plot the exact residual points $(0, 1)$; $(1, -2)$; $(5, 2)$; $(12, -1)$ against the original x-values, include a horizontal $e = 0$ reference, and state the residual-axis units are response-error units.



Residual points	(0, 1), (1, −2), (5, 2), (12, −1)
Zero reference	Yes
Axis roles	Horizontal: original explanatory input Vertical: observed minus predicted response

Your response: _____

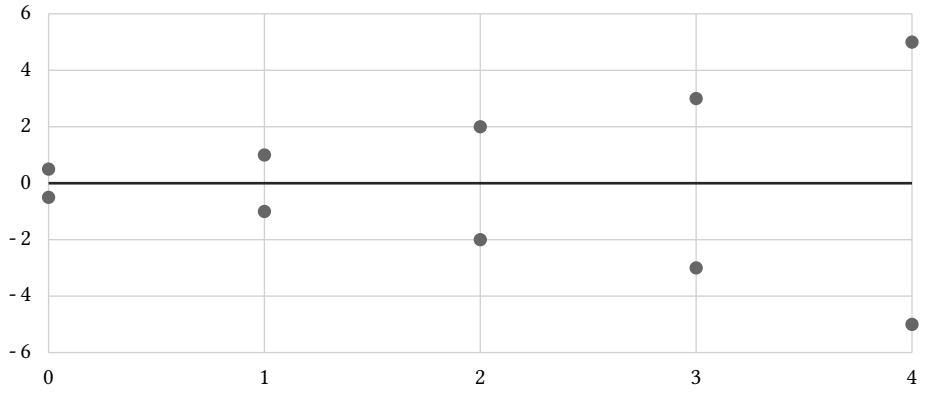
Algebra 1

Residual Plots

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.

Residuals begin near zero and widen toward high x. Exact residual points are $(0, -0.5)$; $(0, 0.5)$; $(1, -1)$; $(1, 1)$; $(2, -2)$; $(2, 2)$; $(3, -3)$; $(3, 3)$; $(4, -5)$; $(4, 5)$. Compare vertical spread across x-ranges, separate spread from center-pattern changes, and decide whether one error scale is adequate.



Residual points	(0, −0.5), (0, 0.5), (1, −1), (1, 1), (2, −2), (2, 2), (3, −3), (3, 3), (4, −5), (4, 5)
Zero reference	Yes
Coverage note	Residuals begin near zero and widen toward high x.

Residual Plots

Full Worked Solutions - excerpt

Worked example

Problem. Audit this residual-plot conclusion: Residuals $8, -8, 5, -5$ sum to zero, and the fit is called perfect. Identify the evidence flaw involving scale, zero reference, omission, provenance, sign, units, pattern, or certainty, and rewrite the assessment.

Claim	Residuals $8, -8, 5, -5$ sum to zero, and the fit is called perfect.

Answer. repair: The signed sum cancels while individual errors remain large; inspect magnitudes and patterns.

Explanation and check.

Correction: The signed sum cancels while individual errors remain large; inspect magnitudes and patterns.

Worked example

Problem. Audit this residual-plot conclusion: Six residuals look irregular, so the model is said to be proven true. Identify the evidence flaw involving scale, zero reference, omission, provenance, sign, units, pattern, or certainty, and rewrite the assessment.

Claim	Six residuals look irregular, so the model is said to be proven true.

Answer. repair: Random-looking scatter is consistent with usefulness but cannot prove the model true.

Explanation and check.

Correction: Random-looking scatter is consistent with usefulness but cannot prove the model true.