Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Residuals & Residual Plots | Algebra 1 | 2-Topic Bundle

2-topic bundle | 192 problems | Four activity formats

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01 Calculating Residuals

View individual product and its full preview

02 Residual Plots

View individual product and its full preview

In every topic

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

Product previews

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

16 PDFs and 2 READMEs; 299 buyer PDF pages across the 2 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

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.

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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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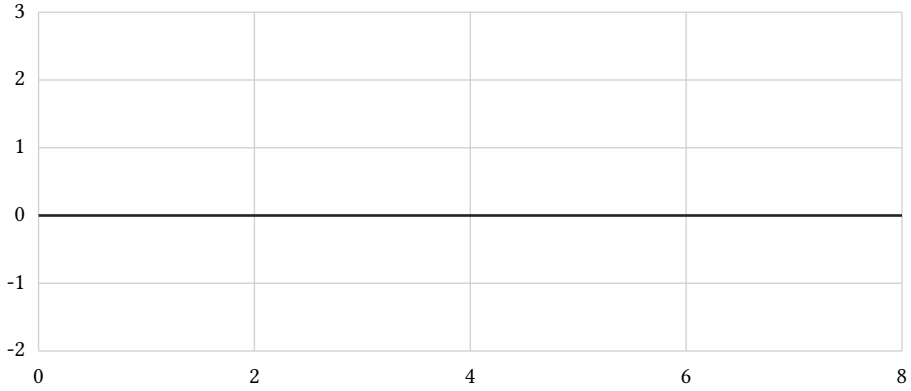
Algebra 1

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

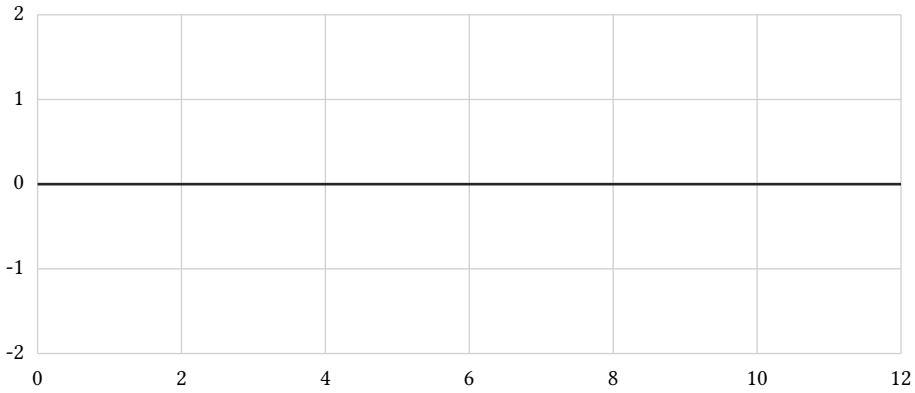
Residual Plots

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: _____

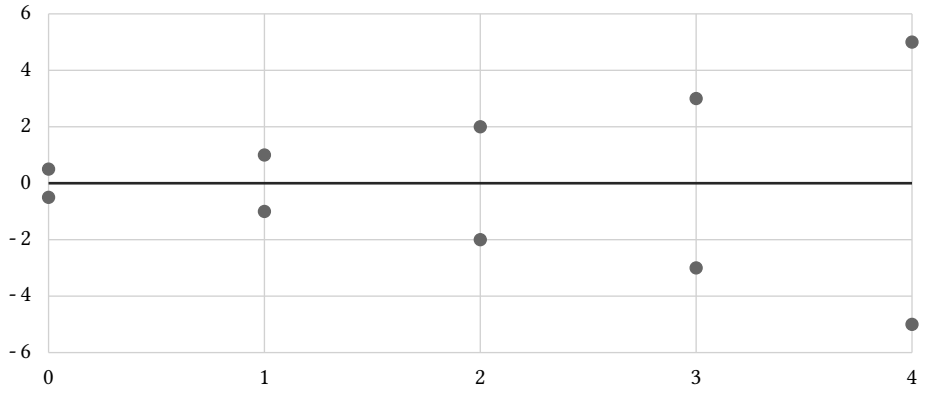
Algebra 1

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.