

Algebra 1
Scatter Plots, Correlation & Causation | Algebra 1 | 3-Topic Bundle

3-topic bundle | 288 problems | Four activity formats

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](#)

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.

24 PDFs and 3 READMEs; 385 buyer PDF pages across the 3 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.

Algebra 1
Scatter Plots and Bivariate Data

Scatter Plots and Bivariate Data | A1-U10-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 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.

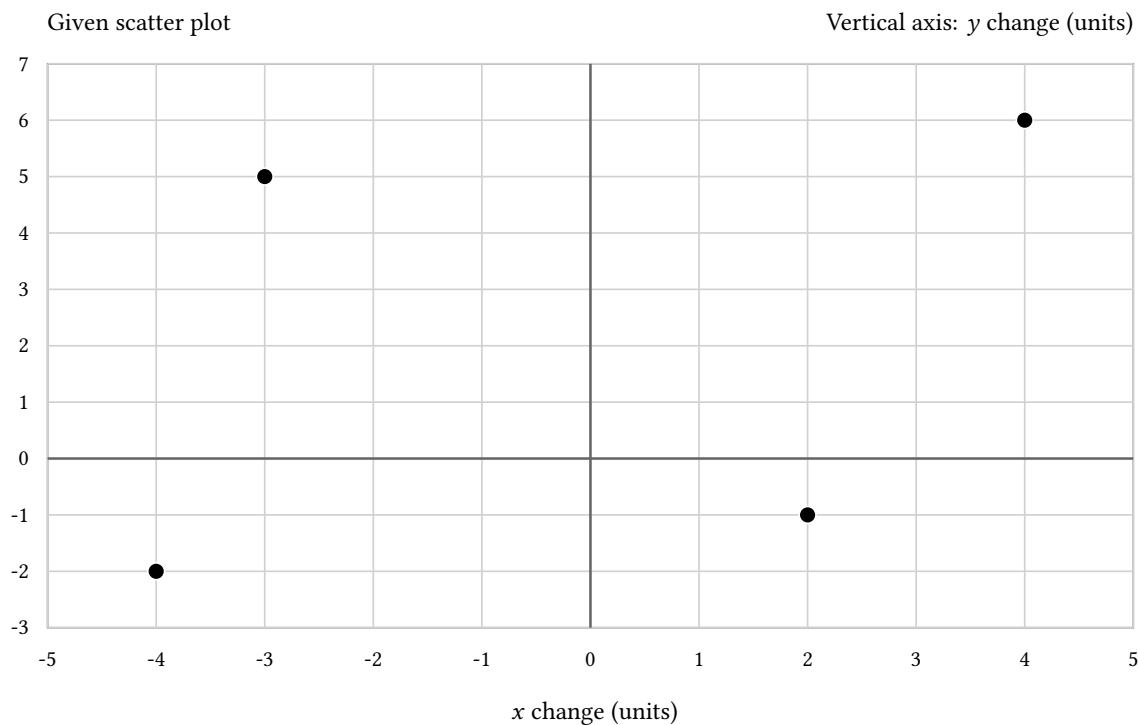
Algebra 1

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.



Bank label: _____

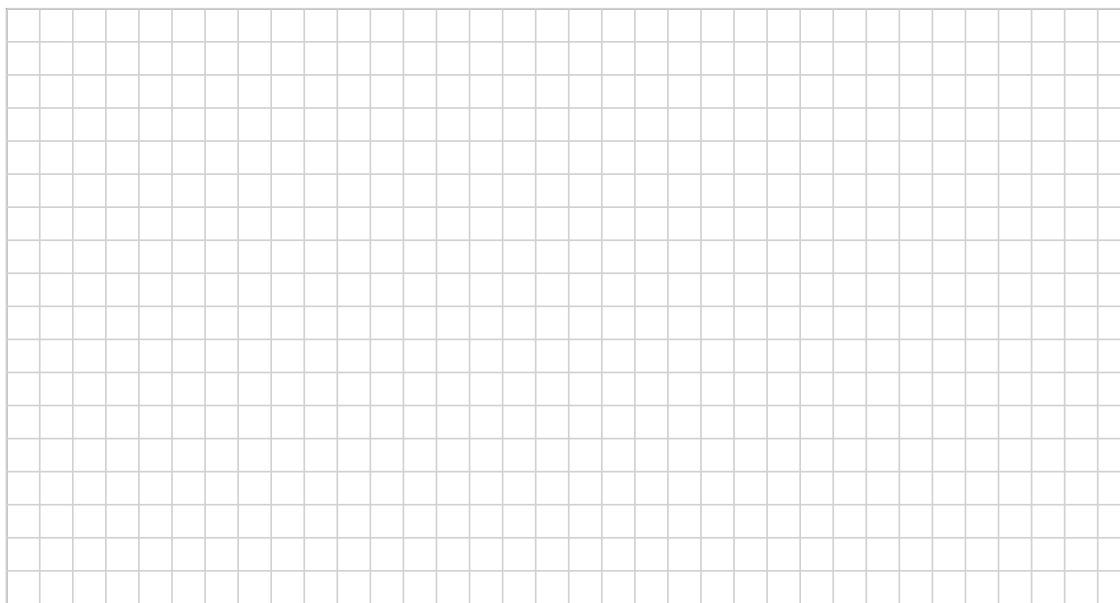
Algebra 1

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)
<i>A</i>	1	3
<i>B</i>	2	5
<i>C</i>	3	8

Algebra 1

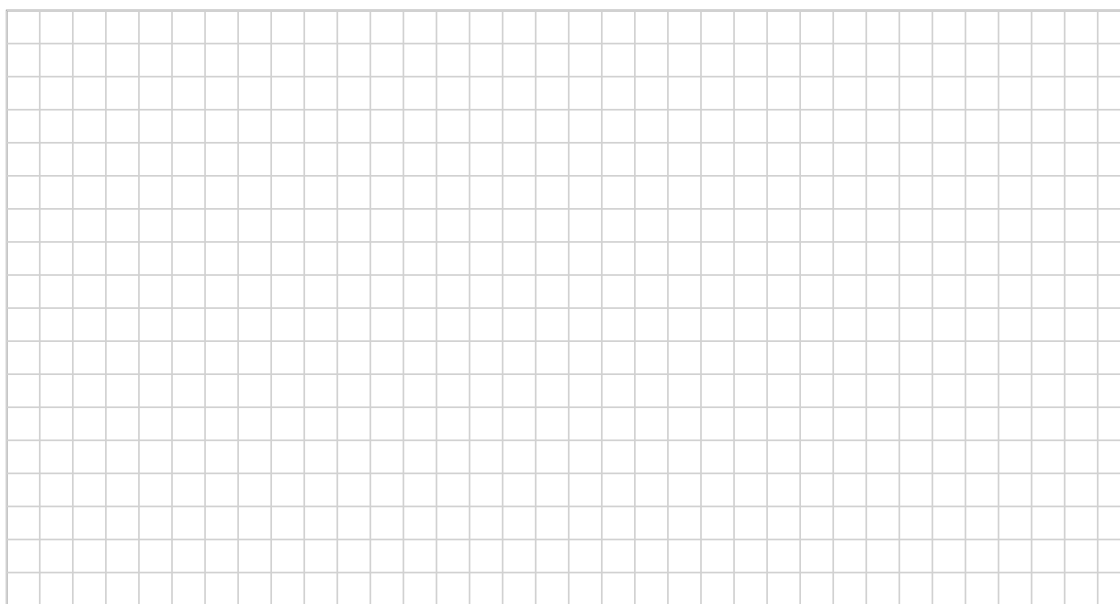
Scatter Plots and
Bivariate Data

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: _____

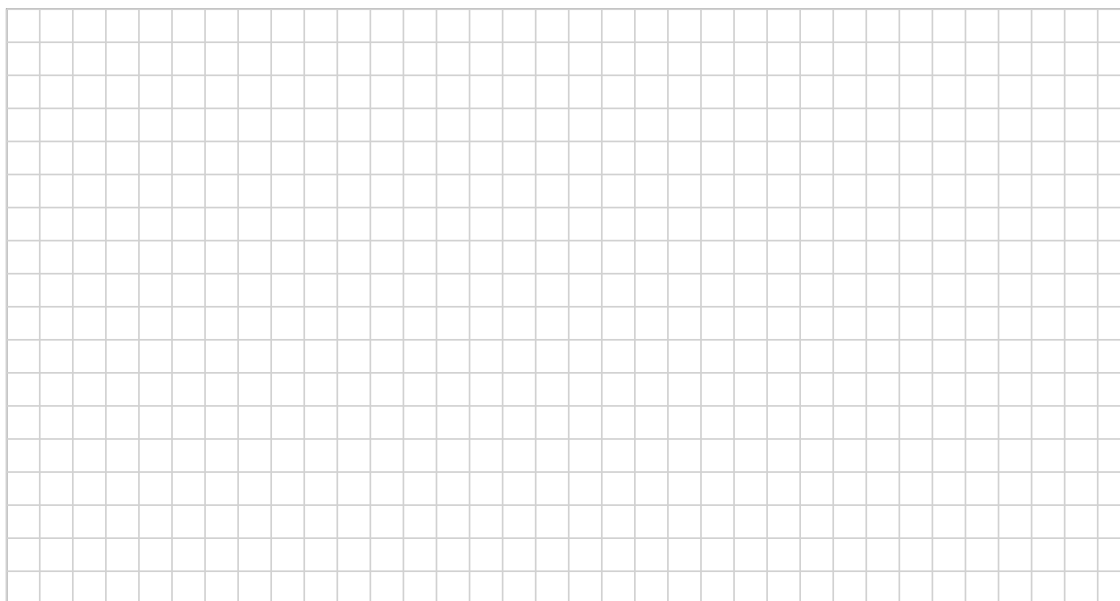
Algebra 1

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

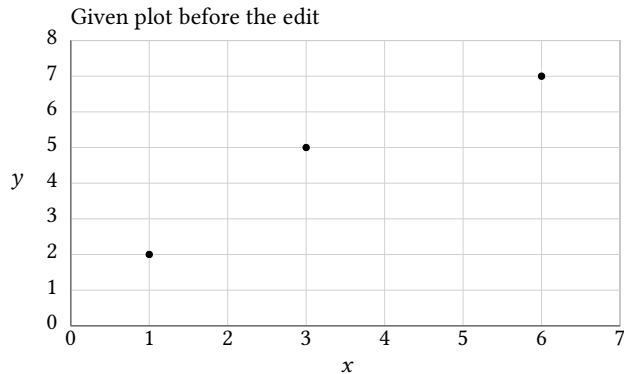
Scatter Plots and Bivariate Data

Full Worked Solutions - excerpt

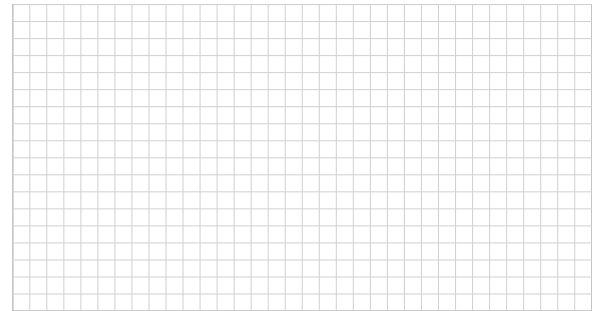
Worked example

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



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:

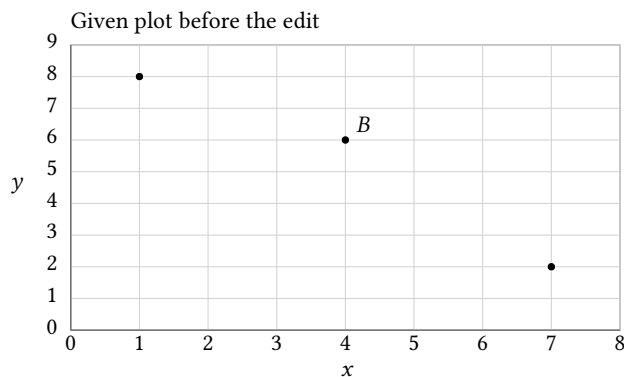
Explanation and check.

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



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.

Algebra 1
Correlation and Linear Association

Correlation and Linear Association | A1-U10-P08
96 problems · Four activity formats

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Topic focus
Across 96 tasks this topic asks for evidence-based linear association statement.
8 PDFs and a README; 140 buyer pages.

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: _____

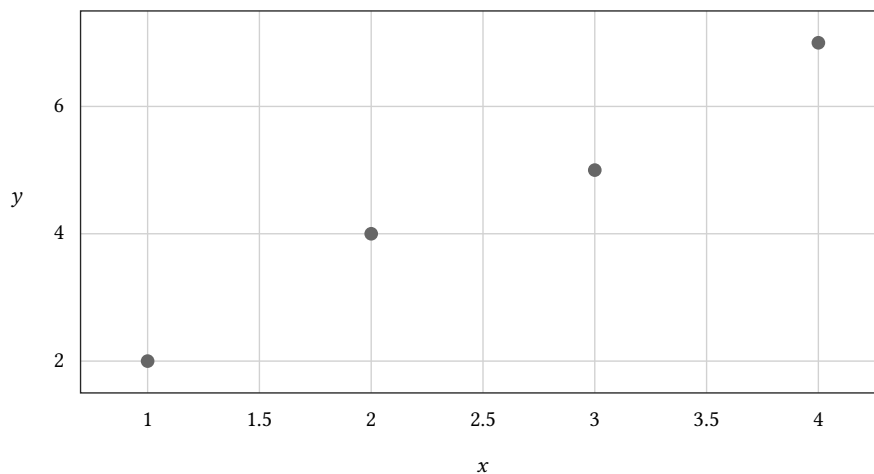
Algebra 1

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

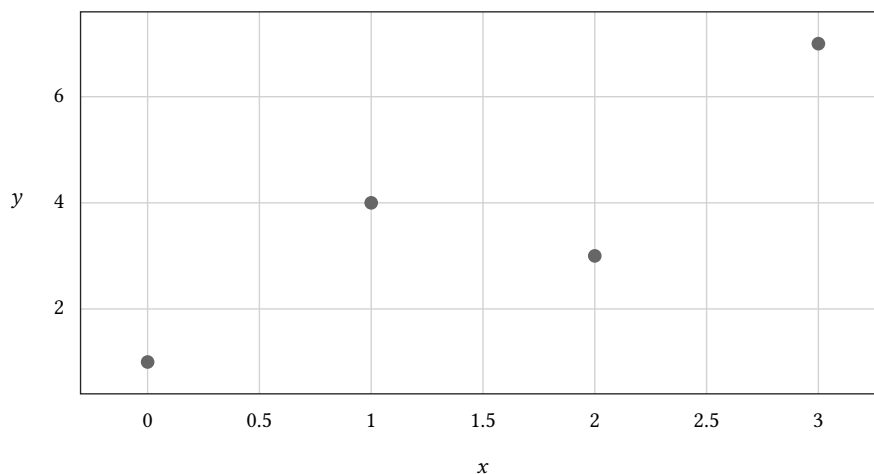
Correlation and
Linear Association

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: _____

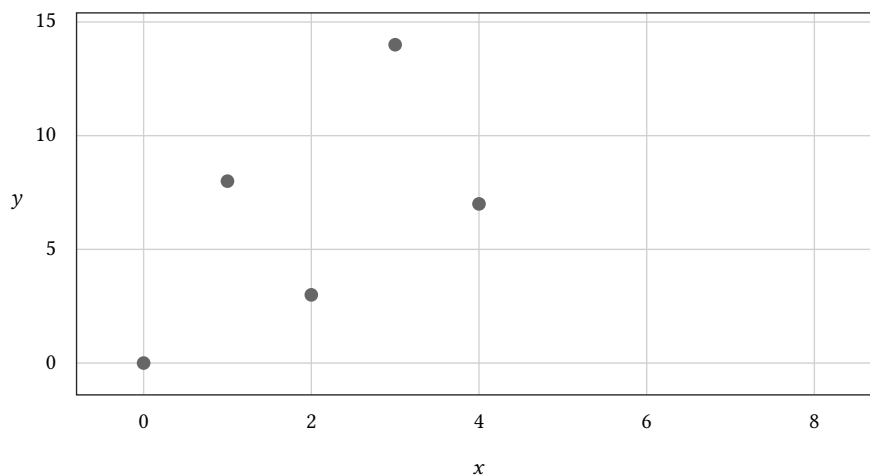
Algebra 1

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 $x_{\text{new}} = x - 100$ and $y_{\text{new}} = y + 12$. 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 .

Algebra 1
Correlation vs Causation

Correlation vs Causation | A1-U10-P09
96 problems · Four activity formats

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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.

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 $X \rightarrow Y$ and $Y \rightarrow X$. 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.