

Algebra 1
Data Displays and Distributions

6-topic bundle | 576 problems | Four activity formats

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Mean, Median, and Mode
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Range, Quartiles, and IQR
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Comparing Data Distributions
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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.

48 PDFs and 6 READMEs; 833 buyer PDF pages across the 6 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
Mean, Median, and Mode

Mean, Median, and Mode | A1-U10-P01

96 problems · Four activity formats

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

Topic focus
Across 96 tasks this topic asks for count, middle position(s), middle value(s), median, and unit, weighted total, count, exact mean, and unit, chosen measure, data-based evidence, and purpose-based justification, construction or impossibility proof with sum, rank, and frequency verification, identified misconception, corrected computation, and corrected claim and before/after totals, counts, mean, median, modes, and change classification.

8 PDFs and a README; 71 buyer pages.

Algebra 1

Mean, Median,
and Mode

Name: _____ Date: _____ Class: _____

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

Use the exact frequency table of points to calculate the mean. Count repeated observations rather than averaging only the distinct values. All frequencies are one. Use the complete requested calculation as the matching response: total/count/mean, ordered middle positions and median, or target total and missing value as applicable. Keep the original units and feasibility checks.

value	frequency
2	1
5	1
8	1

Bank label: _____

Find the mean of the points data represented by the table, and show the weighted total and total count that justify it. The four observations total 24. Use the complete requested calculation as the matching response: total/count/mean, ordered middle positions and median, or target total and missing value as applicable. Keep the original units and feasibility checks.

value	frequency
4	1
6	2
8	1

Bank label: _____

Use the exact frequency table of books to calculate the mean. Count repeated observations rather than averaging only the distinct values. There are three observations, not two. Use the complete requested calculation as the matching response: total/count/mean, ordered middle positions and median, or target total and missing value as applicable. Keep the original units and feasibility checks.

value	frequency
3	2
7	1

Bank label: _____

Compute the exact mean from this value-frequency table and report it in degrees. Include every value-times-frequency contribution. Opposite contributions cancel. Use the complete requested calculation as the matching response: total/count/mean, ordered middle positions and median, or target total and missing value as applicable. Keep the original units and feasibility checks.

value	frequency
-2	1
0	1
2	1

Bank label: _____

Algebra 1

Mean, Median,
and Mode

Name: _____ Date: _____ Class: _____

Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. A value without its unit is not a complete answer.

Determine the median of the exact account units frequency table. First order values and use the total count to locate the middle position or positions. The middle values straddle zero.

value	frequency
-7	1
-1	2
3	2
8	1

Determine the median of the exact dollars frequency table. First order values and use the total count to locate the middle position or positions. The most frequent value alone does not determine an even-sample median.

value	frequency
100	4
2	5
3	1

Determine the median of the exact seconds frequency table. First order values and use the total count to locate the middle position or positions. Keep hundredths exact while ordering.

value	frequency
$\frac{101}{100}$	2
$\frac{99}{100}$	1
$\frac{21}{20}$	2
1	1

Determine the median of the exact points frequency table. First order values and use the total count to locate the middle position or positions. For fourteen observations, positions 7 and 8 must be traced through sorted cumulative counts.

value	frequency
7	6
1	3
4	1
10	4

Algebra 1

Mean, Median,
and Mode

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: count: 7; median: 3; middle positions: 4; middle values: 3; unit: points

Determine the median of the exact hours frequency table. First order values and use the total count to locate the middle position or positions. The fourth and fifth positions fall in the same value row. Use the complete requested calculation as the matching response: total/count/mean, ordered middle positions and median, or target total and missing value as applicable. Keep the original units and feasibility checks.

value	frequency
1	3
8	2
4	3

Your response: _____

Incoming: count: 3; median: 0; middle positions: 2; middle values: 0; unit: degrees

Determine the median of the exact meters frequency table. First order values and use the total count to locate the middle position or positions. Exact decimal order is 1.5, 2.5, 3.5. Use the complete requested calculation as the matching response: total/count/mean, ordered middle positions and median, or target total and missing value as applicable. Keep the original units and feasibility checks.

value	frequency
$\frac{5}{2}$	1
$\frac{3}{2}$	1
$\frac{7}{2}$	1

Your response: _____

Incoming: count: 15; mean: $\frac{23}{15}$; unit: errors; weighted total: 23

Compute the exact mean from this value-frequency table and report it in elevation units. Include every value-times-frequency contribution. Deviation arithmetic around -100 must restore the negative baseline. Use the complete requested calculation as the matching response: total/count/mean, ordered middle positions and median, or target total and missing value as applicable. Keep the original units and feasibility checks.

value	frequency
-102	2
-100	5
-93	1

Your response: _____

Incoming: count: 13; mean: $\frac{13008}{13}$; unit: grams; weighted total: 13008

Use the exact frequency table of meters to calculate the mean. Count repeated observations rather than averaging only the distinct values. Exact cancellation is easier in fourths. Use the complete requested calculation as the matching response: total/count/mean, ordered middle positions and median, or target total and missing value as applicable. Keep the original units and feasibility checks.

value	frequency
$-\frac{7}{4}$	4
$\frac{1}{2}$	3
$\frac{9}{4}$	2

Your response: _____

Algebra 1

Mean, Median, and Mode

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.

Mode convention: no mode when all distinct or all observed frequencies tie The ordered-data summary begins from 2, 3, 4, 5, 6 points. Apply this edit: add 20. Recompute the mean, median, and mode set, then state exactly which summaries change. The new extreme affects the total and even-sample middle positions. Compare the complete before-and-after center summaries under the original edit. Explain which mean, median and mode statements change and which remain true, using totals, ordered ranks and frequencies separately.

The ordered-data summary begins from 2, 4, 4, 6, 10 minutes. Apply this edit: remove one occurrence of 10. Recompute the mean, median, and mode set, then state exactly which summaries change. Remove only the single largest observation. Compare the complete before-and-after center summaries under the original edit. Explain which mean, median and mode statements change and which remain true, using totals, ordered ranks and frequencies separately.

Mode convention: no mode when all distinct or all observed frequencies tie The ordered-data summary begins from 1, 2, 3, 4, 5 points. Apply this edit: replace one 1 with 5. Recompute the mean, median, and mode set, then state exactly which summaries change. The replacement changes frequency and total while the middle position stays central. Compare the complete before-and-after center summaries under the original edit. Explain which mean, median and mode statements change and which remain true, using totals, ordered ranks and frequencies separately.

Mode convention: no mode when all distinct or all observed frequencies tie The ordered-data summary begins from 2, 4, 6, 8, 10, 12 points. Apply this edit: add 0. Recompute the mean, median, and mode set, then state exactly which summaries change. The sample changes from even to odd. Compare the complete before-and-after center summaries under the original edit. Explain which mean, median and mode statements change and which remain true, using totals, ordered ranks and frequencies separately.

Mean, Median, and Mode

Full Worked Solutions - excerpt

Worked example

Problem. Order the values before selecting a middle position. Data: 9, 1, 8, 2, 3. A student claims: The median is the displayed middle entry, 8. Diagnose the exact mistake and replace the claim with a correct central-summary statement.

Answer. correction: the median is 3.; diagnosis: the middle entry was selected before sorting

Explanation and check.

The ordered data are 1, 2, 3, 8, 9, whose third value is 3. Therefore the median is 3.

Worked example

Problem. Inspect every value tied at the greatest frequency. Data: 2, 2, 5, 5, 8. A student claims: The mode is 2. Diagnose the exact mistake and replace the claim with a correct central-summary statement.

Answer. correction: the mode set is $\{2, 5\}$.; diagnosis: a second value tied for greatest frequency was omitted

Explanation and check.

Both 2 and 5 occur twice, while 8 occurs once. Therefore the mode set is $\{2, 5\}$.

Algebra 1
Range, Quartiles, and IQR

Range, Quartiles, and IQR | A1-U10-P02

96 problems · Four activity formats

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Topic focus

Across 96 tasks this topic asks for before/after ordered data, range, quartiles, IQR, and change classification, observed minimum, observed maximum, range, and unit, admissible ordered dataset with range and quartile verification, or impossibility proof, ordered data, halves, Q1, Q3, IQR, unit, and stated convention, cumulative intervals, observed endpoints, range, Q1, Q3, IQR, and unit and error diagnosis, corrected rank or endpoint calculation, and corrected spread statement.

8 PDFs and a README; 69 buyer pages.

Algebra 1

Range, Quartiles,
and IQR

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 display order is not numerical order. The exact value-frequency table records points. Identify the smallest and largest observed values and calculate the range with its unit. Use maximum minus minimum, not last minus first. Match the complete originally requested extrema/quartile/spread response with units and any transformation order statement. Keep the declared median-of-halves convention.

Value	Frequency
8	1
3	1
11	1

Bank label: _____

The support crosses zero. The exact value-frequency table records degrees. Identify the smallest and largest observed values and calculate the range with its unit. Subtracting a negative endpoint increases the difference. Match the complete originally requested extrema/quartile/spread response with units and any transformation order statement. Keep the declared median-of-halves convention.

Value	Frequency
-4	1
2	1
7	1

Bank label: _____

The minimum occurs more than once. The exact value-frequency table records hours. Identify the smallest and largest observed values and calculate the range with its unit. Multiplicity does not change the endpoint distance. Match the complete originally requested extrema/quartile/spread response with units and any transformation order statement. Keep the declared median-of-halves convention.

Value	Frequency
2	3
5	1
9	1

Bank label: _____

The maximum has the greatest frequency. The exact value-frequency table records tokens. Identify the smallest and largest observed values and calculate the range with its unit. Range depends on its value, not how often it occurs. Match the complete originally requested extrema/quartile/spread response with units and any transformation order statement. Keep the declared median-of-halves convention.

Value	Frequency
1	1
6	2
10	4

Bank label: _____

Algebra 1

Range, Quartiles,
and IQR

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.

Both endpoints repeat with different multiplicities. Order these exact observations measured in ratings: 1, 1, 3, 5, 7, 9, 9, 9. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. Use half positions rather than endpoint counts alone. 	A single extreme appears at each end. Order these exact observations measured in units: -100, 2, 3, 4, 5, 6, 7, 100. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. The quartiles come from interior half positions.
Every observed value occurs as a pair. Order these exact observations measured in scores: 1, 1, 3, 3, 5, 5, 7, 7, 9, 9. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. The half boundary cuts between the two copies of 5. 	Each half has its own plateau. Order these exact observations measured in minutes: 2, 2, 2, 4, 6, 8, 8, 8. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. The central split lies between 4 and 6.
Two distant extremes bookend a tight center. Order these exact observations measured in units: -1000, 1, 2, 3, 4, 5, 6, 7, 1000. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. Trace half positions rather than averaging endpoints. 	Several frequency blocks meet quartile boundaries. Order these exact observations measured in ratings: 1, 1, 1, 2, 2, 4, 4, 4, 4, 9, 9, 12. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. Count ordered positions inside each repeated block.

Algebra 1

Range, Quartiles,
and IQR

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: maximum: $\frac{5}{2}$; minimum: $\frac{1}{2}$; range: 2; unit: meters The five values are deliberately unsorted. Order these exact observations measured in points: 9, 1, 5, 3, 7. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. Remove the third value before finding the two half-medians. Match the complete originally requested extrema/quartile/spread response with units and any transformation order statement. Keep the declared median-of-halves convention. Your response: _____	Incoming: convention: exclude overall median for odd sample size; iqr: 11; q1: -4; q3: 7; unit: change units Every observation is below zero. Order these exact observations measured in degrees: -12, -10, -8, -6, -4, -2. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. $Q3$ can be negative while IQR remains nonnegative. Match the complete originally requested extrema/quartile/spread response with units and any transformation order statement. Keep the declared median-of-halves convention. Your response: _____
Incoming: convention: exclude overall median for odd sample size; iqr: 6; q1: 4; q3: 10; unit: minutes Seven observations leave three values in each half after exclusion. Order these exact observations measured in pages: 14, 2, 8, 4, 12, 6, 10. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. The overall median belongs to neither half. Match the complete originally requested extrema/quartile/spread response with units and any transformation order statement. Keep the declared median-of-halves convention. Your response: _____	Incoming: convention: exclude overall median for odd sample size; iqr: 4; q1: $\frac{5}{2}$; q3: $\frac{13}{2}$; unit: ratings After removing the fifth ordered value, each half has four values. Order these exact observations measured in seconds: 18, 2, 14, 6, 10, 4, 16, 8, 12. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. Average the two middle values within each half. Match the complete originally requested extrema/quartile/spread response with units and any transformation order statement. Keep the declared median-of-halves convention. Your response: _____
Incoming: convention: exclude overall median for odd sample size; iqr: 7; q1: $\frac{5}{2}$; q3: $\frac{19}{2}$; unit: minutes Eleven values leave five in each half. Order these exact observations measured in pages: 0, 1, 2, 3, 4, 5, 7, 9, 12, 16, 21. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. $Q1$ and $Q3$ are the third positions of their halves. Match the complete originally requested extrema/quartile/spread response with units and any transformation order statement. Keep the declared median-of-halves convention. Your response: _____	Incoming: convention: exclude overall median for odd sample size; iqr: 11; q1: 1; q3: 12; unit: hours Three copies of the median value occupy central positions. Order these exact observations measured in points: 1, 2, 4, 6, 6, 6, 8, 10, 12. Using the median-of-halves convention that excludes the overall median when n is odd, find $Q1$, $Q3$, and IQR. Exclude the fifth position only; the other copies stay in their halves. Match the complete originally requested extrema/quartile/spread response with units and any transformation order statement. Keep the declared median-of-halves convention. Your response: _____

Algebra 1

Range, Quartiles,
and IQR

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.

Nine observations are compressed into five rows. Use the exact frequency table of points and the convention that excludes the overall median when n is odd. Locate quartile ranks by cumulative frequency, then report the range, $Q1$, $Q3$, and IQR. Exclude ordered position 5 before splitting. Choose between expanding the frequency table into ordered observations and locating the needed ranks with cumulative frequencies. Justify the efficient choice for these counts, then show the original required rank evidence and apply the stated quartile convention.

Value	Frequency
1	2
3	2
5	1
7	2
9	2

Ten observations occupy three frequency blocks. Use the exact frequency table of minutes and the convention that excludes the overall median when n is odd. Locate quartile ranks by cumulative frequency, then report the range, $Q1$, $Q3$, and IQR. Split positions 1 – 5 and 6 – 10. Choose between expanding the frequency table into ordered observations and locating the needed ranks with cumulative frequencies. Justify the efficient choice for these counts, then show the original required rank evidence and apply the stated quartile convention.

Value	Frequency
2	3
6	4
10	3

Range, Quartiles, and IQR

Full Worked Solutions - excerpt

Worked example

Problem. Check the required subtraction direction. Given observations 2, 5, 9, a student states: The range is $2 - 9 = -7$. Under the declared quartile convention, identify the precise error and replace the spread calculation with a correct one.

Answer. correction: the range is 7, a nonnegative distance.; diagnosis: minimum was subtracted in the wrong direction

Explanation and check.

The minimum is 2 and maximum is 9, so $\text{range} = 9 - 2 = 7$. Diagnosis: minimum was subtracted in the wrong direction. Therefore the range is 7, a nonnegative distance.

Worked example

Problem. Distinguish an upper quartile from the distance between quartiles. Given ordered data 0, 2, 4, 6, 8, 10, with $Q1 = 2$ and $Q3 = 8$, a student states: The IQR is 8 because $Q3$ is 8. Under the declared quartile convention, identify the precise error and replace the spread calculation with a correct one.

Answer. correction: $Q3$ is 8 but IQR is 6.; diagnosis: $Q3$ was named as the IQR without subtracting $Q1$

Explanation and check.

$\text{IQR} = Q3 - Q1 = 8 - 2 = 6$. Diagnosis: $Q3$ was named as the IQR without subtracting $Q1$. Therefore $Q3$ is 8 but IQR is 6.

Algebra 1
Dot Plots

Dot Plots | A1-U10-P03
96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
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Topic focus
Across 96 tasks this topic asks for uniform labeled axis, occupied coordinates, exact stack heights, empty ticks, and total dot count, mapped or edited individual coordinates, normalized new stacks, total dots, and unit, qualifying coordinates, contributing stack heights, exact event count, and total count, feature claim, exact coordinate/stack evidence, and interpretation limit, decoded frequencies, ordered observations, total count, and treatment of empty ticks and specific display defect, source-to-dot audit, corrected stacks or axis, and key.
8 PDFs and a README; 207 buyer pages.

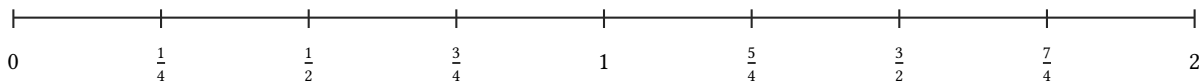
Algebra 1

Dot Plots

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.

Quarter-unit data leave several exact empty ticks. Plot one dot for each kilogram observation on a uniform number line from 0 to 2 with tick spacing $\frac{1}{4}$: $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{2}$, $\frac{5}{4}$, $\frac{7}{4}$. Give the exact stack height at every occupied coordinate and retain empty ticks. Do not round quarters to tenths. Match the complete originally requested plot, qualifying-stack/count response, or reconstructed data with its dot key and units. A constructed dot plot must remain a plotted response, not just a count.



Raw observations	$\frac{1}{4}, \frac{1}{2}, \frac{1}{2}, \frac{5}{4}, \frac{7}{4}$	
Axis	Start	0
	End	2
	Tick step	$\frac{1}{4}$
	Ticks	$0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, \frac{5}{4}, \frac{3}{2}, \frac{7}{4}, 2$
	Uniform	Yes
Key	one dot represents one observation	
Unit	kilogram	

Bank label: _____

Algebra 1

Dot 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. A value without its unit is not a complete answer.

Consecutive supports have four different stack roles. An exact dot plot on a uniform goal axis from 0 to 3 with step 1 has stacks 0:1 displayed dot, 1:2 displayed dots, 2:4 displayed dots, 3:2 displayed dots; one displayed dot represents 1 observation. Reconstruct the ordered data and a value-frequency table, explicitly accounting for empty ticks. List values in coordinate order.



Axis	Start	0
	End	3
	Tick step	1
	Ticks	0, 1, 2, 3
	Uniform	Yes
Stacks	(Coordinate 0; Displayed dots 1), (Coordinate 1; Displayed dots 2), (Coordinate 2; Displayed dots 4), (Coordinate 3; Displayed dots 2)	
Key	one displayed dot represents 1 observation	
Unit	goal	

Algebra 1

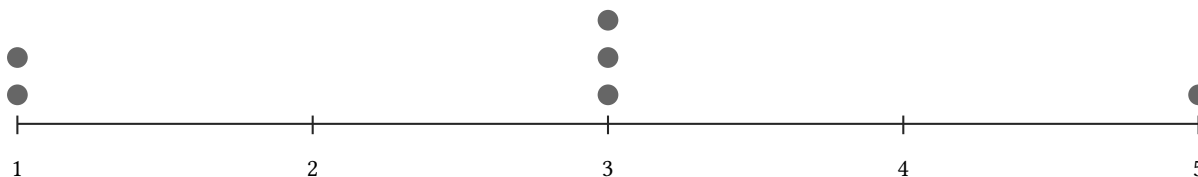
Dot Plots

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: condition: at most $-\frac{3}{2}$; count: 3; qualifying stacks: (coordinate: $-\frac{5}{2}$; dots: 2), (coordinate: $-\frac{3}{2}$; dots: 1); total: 8; unit: degree

The excluded value has no dot. The exact dot plot uses book coordinates on a uniform axis with step 1; its occupied stacks are 1:2, 3:3, 5:1. How many observations are not equal to 4? State which stacks count and handle endpoint inclusion exactly. Every observed dot remains in the event. Match the complete originally requested plot, qualifying-stack/count response, or reconstructed data with its dot key and units. A constructed dot plot must remain a plotted response, not just a count.



Axis	Start	1
	End	5
	Tick step	1
	Ticks	1, 2, 3, 4, 5
	Uniform	Yes
Stacks	(Coordinate 1; Dots 2), (Coordinate 3; Dots 3), (Coordinate 5; Dots 1)	
Key	one dot represents one observation	
Unit	book	
Condition	not equal to 4	

Your response: _____

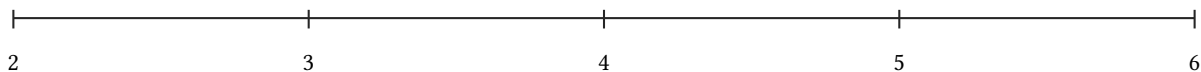
Algebra 1

Dot 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.

Three distinct observations need three separate marks. Plot one dot for each score observation on a uniform number line from 2 to 6 with tick spacing 1: 2, 4, 6. Give the exact stack height at every occupied coordinate and retain empty ticks. Ticks 3 and 5 remain empty. Choose a construction strategy: tally each coordinate frequency before drawing, or place dots in source order and then audit the stacks. Justify the efficient choice for these repetitions, then construct the exact original plot and verify the total.



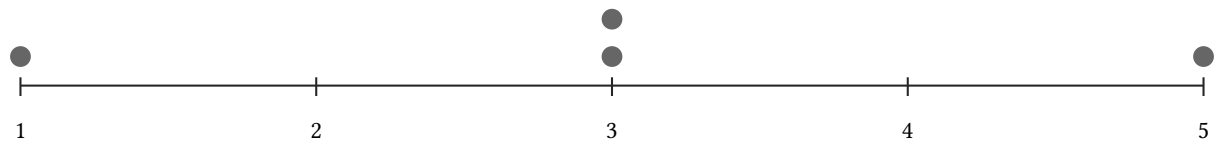
Raw observations	2, 4, 6	
Axis		
	Start	2
	End	6
	Tick step	1
	Ticks	2, 3, 4, 5, 6
	Uniform	Yes
Key	one dot represents one observation	
Unit	score	

Dot Plots

Full Worked Solutions - excerpt

Worked example

Problem. Compare the repeated source value with its stack height. Source evidence: raw ratings 1, 3, 3, 3, 5 Proposed dot display: stacks 1 : 1, 3 : 2, 5 : 1 Diagnose the exact one-to-one, coordinate, key, or axis error and state a corrected display.



Source evidence	raw ratings 1, 3, 3, 3, 5
Proposed display	stacks 1:1, 3:2, 5:1
Declared key	one dot represents one observation
Unit	rating

Answer. correction: use stacks 1 : 1, 3 : 3, 5 : 1 for five total dots.; diagnosis: one repeated observation at coordinate 3 is missing; key: one dot represents one observation; unit: rating

Explanation and check.

Audit: The source contains three copies of 3 but the proposal shows only two. Diagnosis: one repeated observation at coordinate 3 is missing. Correction: use stacks 1 : 1, 3 : 3, 5 : 1 for five total dots.

Algebra 1
Histograms

Histograms | A1-U10-P04
96 problems · Four activity formats

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Topic focus
Across 96 tasks this topic asks for value-to-bin assignments, all bin frequencies, total count, endpoint convention, and unit, feasibility with implied counts, maximum minus minimum frequency, complete possible-count set, diagnosis and repaired intervals and combined exact count.
8 PDFs and a README; 175 buyer pages.

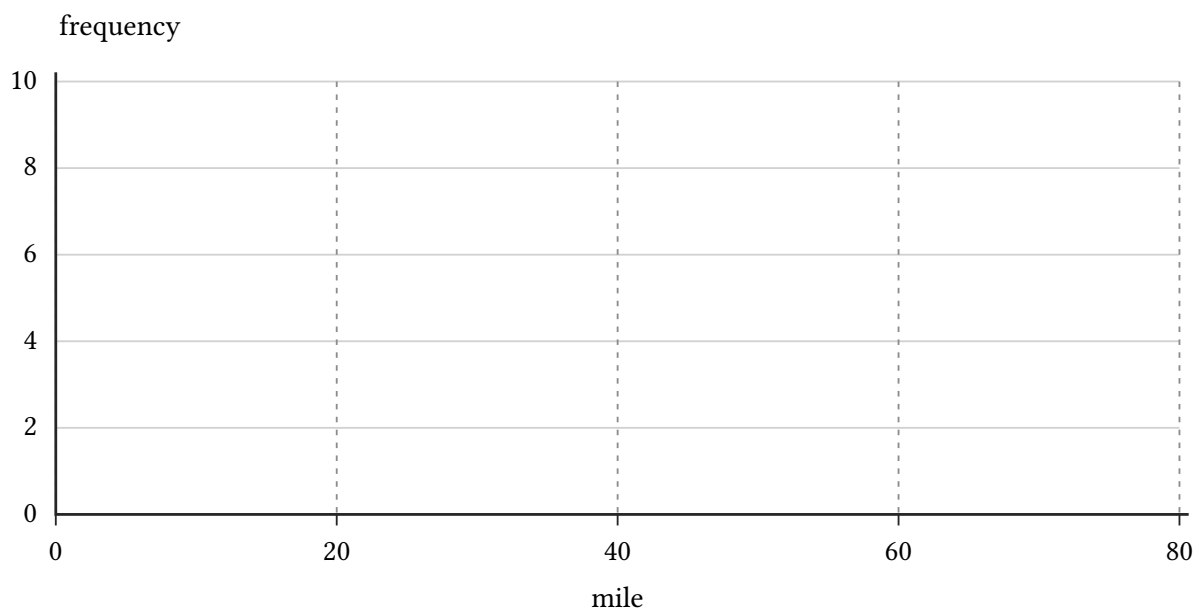
Algebra 1

Histograms

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 coarse scale uses twenty-unit intervals. Construct a frequency histogram for the exact mile observations 3, 18, 20, 39, 41, 55, 60, 79, 80 using equal-width bin edges 0, 20, 40, 60, 80. Every bin is left-closed/right-open, except the final bin includes its right endpoint. Tally each value once, report every bar height, and retain empty bins. Horizontal width does not change the fact that height is frequency. Match the complete originally requested histogram, count, fraction or density-frequency response. Preserve bar boundaries, the frequency/density distinction, exact endpoint rules and units.



Position	Supplied value
1	3
2	18
3	20
4	39
5	41
6	55
7	60
8	79
9	80

Bank label: _____

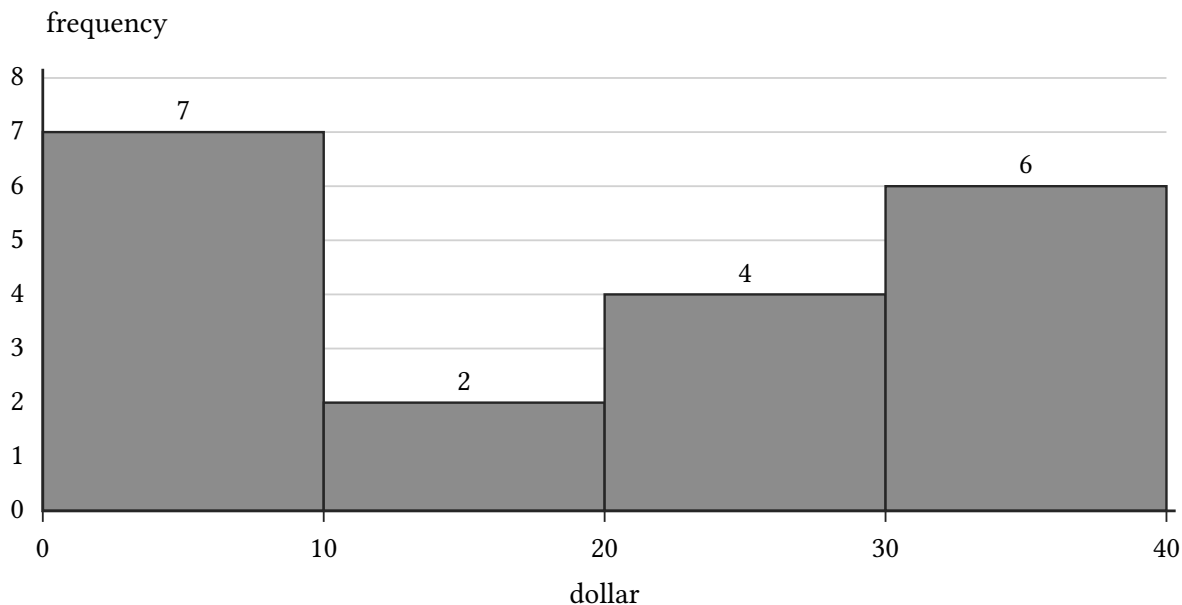
Algebra 1

Histograms

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 requested set is a union rather than one continuous interval. A frequency histogram has bin edges 0, 10, 20, 30, 40 and bar heights 7, 2, 4, 6 in left-to-right order. Bins are left-closed/right-open, except the final bin includes its right endpoint. Find the count in $[0, 10)$ or $[30, 40]$.



Interval	frequency
[0, 10)	7
[10, 20)	2
[20, 30)	4
[30, 40]	6

Algebra 1

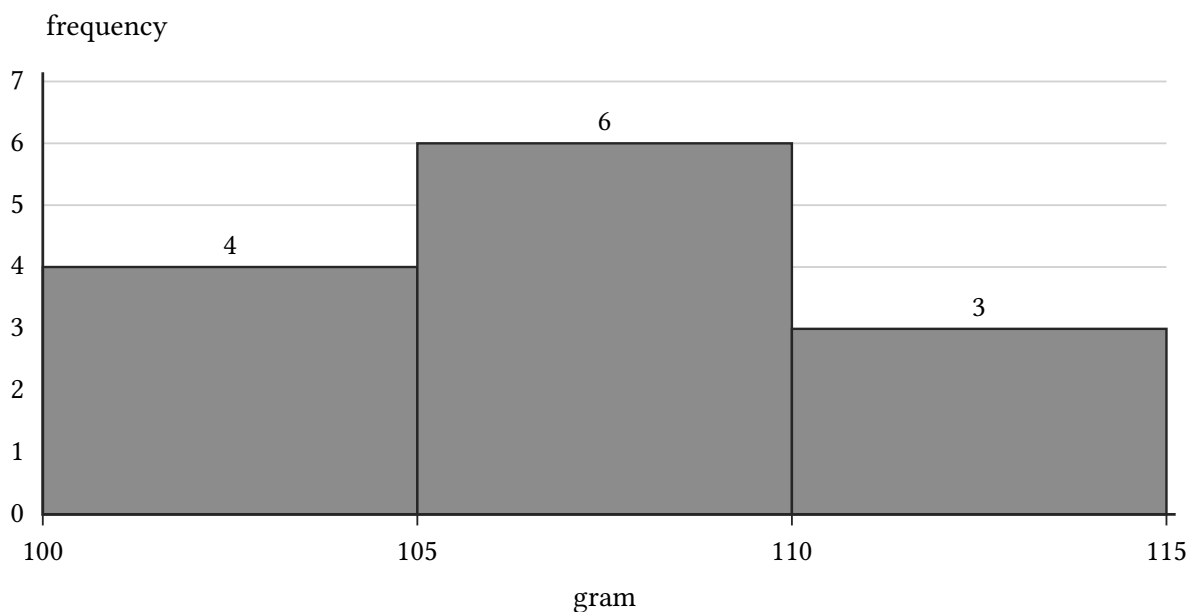
Histograms

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: Frequency by interval (degree Celsius): $[-2, -1)$: 1; $[-1, 0)$: 2; $[0, 1)$: 2; $[1, 2]$: 3. Total: 8 observations.

Each observation contributes to exactly one bar. A frequency histogram has bin edges 100, 105, 110, 115 and bar heights 4, 6, 3 in left-to-right order. Bins are left-closed/right-open, except the final bin includes its right endpoint. How many observations does the entire histogram represent? Match the complete originally requested histogram, count, fraction or density-frequency response. Preserve bar boundaries, the frequency/density distinction, exact endpoint rules and units.



Interval	frequency
$[100, 105)$	4
$[105, 110)$	6
$[110, 115]$	3

Your response: _____

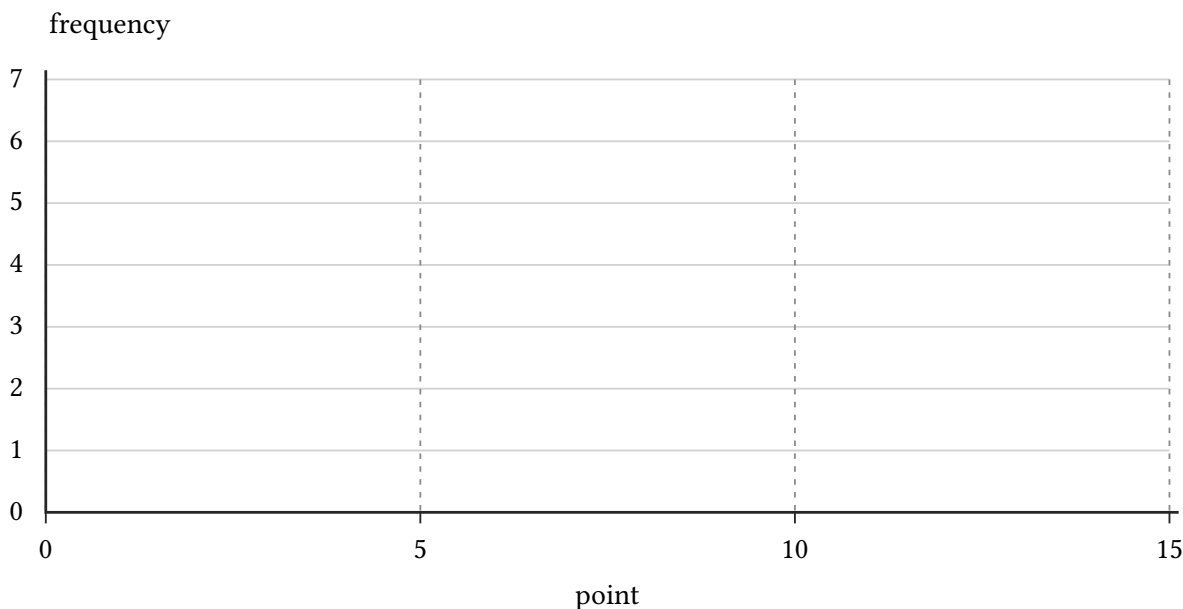
Algebra 1

Histograms

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.

No observation lies on an interior edge. Construct a frequency histogram for the exact point observations 1, 2, 6, 7, 8, 11, 14 using equal-width bin edges 0, 5, 10, 15. Every bin is left-closed/right-open, except the final bin includes its right endpoint. Tally each value once, report every bar height, and retain empty bins. All three bars are occupied. Choose a binning strategy: sort the observations before counting intervals, or tally each observation directly into its bin. Justify the efficient route and use the original edge-inclusion convention to construct the histogram.



Position	Supplied value
1	1
2	2
3	6
4	7
5	8
6	11
7	14

Histograms

Full Worked Solutions - excerpt

Worked example

Problem. In one histogram, a bar contains 9 observations. The corresponding relative-frequency bar has height 0.15. Determine the sample size. Match the complete originally requested histogram, count, fraction or density-frequency response. Preserve bar boundaries, the frequency/density distinction, exact endpoint rules and units.

Answer. 60

Explanation and check.

If $\frac{9}{N} = 0.15$, then $N = \frac{9}{0.15} = 60$.

Worked example

Problem. One bar contains 14 observations. Its relative frequency is exactly $\frac{7}{20}$. Find the total number of observations. Match the complete originally requested histogram, count, fraction or density-frequency response. Preserve bar boundaries, the frequency/density distinction, exact endpoint rules and units.

Answer. 40

Explanation and check.

Solve $\frac{14}{N} = \frac{7}{20}$: $N = 14(\frac{20}{7}) = 40$.

Algebra 1
Box Plots and Outliers

Box Plots and Outliers | A1-U10-P05
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 iQR, both fences, and each candidate classification, iQR, both fences, and each candidate classification, iQR, both fences, and each candidate classification, iQR, both fences, and each candidate classification, iQR, both fences, and each candidate classification and iQR, both fences, and each candidate classification.
8 PDFs and a README; 175 buyer pages.

Algebra 1

Box Plots
and Outliers

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.

One candidate equals the upper fence. For a dataset, $Q1 = 10$ and $Q3 = 20$ points. Under the supplied 1.5-IQR rule, values strictly below the lower fence or strictly above the upper fence are outliers. Classify the candidate observations 5, 10, 20, 35, 36. Fence equality remains included.

$q1$	10
$q3$	20
Candidate values	5, 10, 20, 35, 36
Unit	points
Rule	strictly outside $Q1 - 1.5 \cdot IQR$ and $Q3 + 1.5 \cdot IQR$

Bank label: _____

Candidates straddle both exact cutoff values. For a dataset, $Q1 = 4$ and $Q3 = 8$ units. Under the supplied 1.5-IQR rule, values strictly below the lower fence or strictly above the upper fence are outliers. Classify the candidate observations $-2, -3, 14, 15$. Apply the strict signs separately on the two sides.

$q1$	4
$q3$	8
Candidate values	$-2, -3, 14, 15$
Unit	units
Rule	strictly outside $Q1 - 1.5 \cdot IQR$ and $Q3 + 1.5 \cdot IQR$

Bank label: _____

Only the farthest upper candidate crosses its fence. For a dataset, $Q1 = 2$ and $Q3 = 6$ scores. Under the supplied 1.5-IQR rule, values strictly below the lower fence or strictly above the upper fence are outliers. Classify the candidate observations 0, 6, 12, 13. Do not compare values merely with $Q3$.

$q1$	2
$q3$	6
Candidate values	0, 6, 12, 13
Unit	scores
Rule	strictly outside $Q1 - 1.5 \cdot IQR$ and $Q3 + 1.5 \cdot IQR$

Bank label: _____

The low candidates lie on opposite sides of the cutoff. For a dataset, $Q1 = 5$ and $Q3 = 9$ minutes. Under the supplied 1.5-IQR rule, values strictly below the lower fence or strictly above the upper fence are outliers. Classify the candidate observations $-2, -1, 5, 9$. Use the computed lower fence rather than the minimum.

$q1$	5
$q3$	9
Candidate values	$-2, -1, 5, 9$
Unit	minutes
Rule	strictly outside $Q1 - 1.5 \cdot IQR$ and $Q3 + 1.5 \cdot IQR$

Bank label: _____

Algebra 1

**Box Plots
and Outliers**

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.

Both quartiles coincide. For a dataset, $Q1 = 5$ and $Q3 = 5$ ratings. Under the supplied 1.5-IQR rule, values strictly below the lower fence or strictly above the upper fence are outliers. Classify the candidate observations 4, 5, 6, 5. With IQR zero, both fences equal 5.

$q1$	5
$q3$	5
Candidate values	4, 5, 6, 5
Unit	ratings
Rule	strictly outside $Q1 - 1.5 \cdot \text{IQR}$ and $Q3 + 1.5 \cdot \text{IQR}$

Algebra 1

Box Plots
and Outliers

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: lower fence: -24 ; lower whisker: -18 ; outlier marks: ; upper fence: 20 ; upper whisker: 5

A signed dataset has no separated extremes. The ordered-source net-points data are $-6, -4, -2, 0, 2, 4, 6, 8$. Use median-of-halves quartiles and the modified-box rule: strict 1.5-IQR outliers are marked separately, while each whisker ends at the most extreme observed nonoutlier. Determine both whisker endpoints and every outlier mark. Preserve the negative lower coordinate.



Raw data	$-6, -4, -2, 0, 2, 4, 6, 8$
Unit	net-points
Quartile convention	median of halves; exclude overall median for odd n
Outlier rule	strictly outside 1.5-IQR fences

Your response: _____

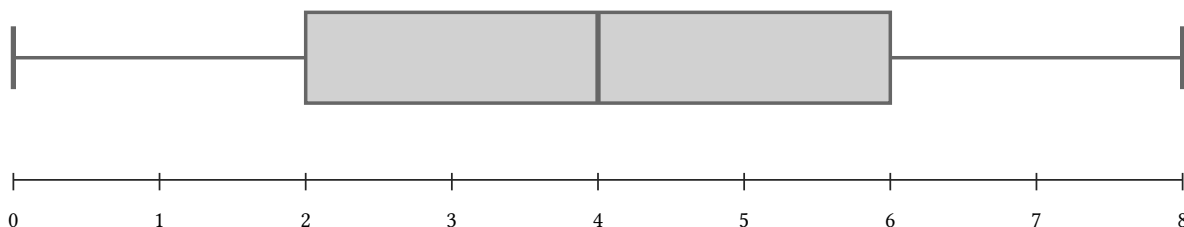
Algebra 1

Box Plots
and Outliers

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 summary need not identify one sample. Use the median-of-halves convention, excluding the overall median for odd n . The required five-number summary is (0, 2, 4, 6, 8) in minimum/ $Q1$ /median/ $Q3$ /maximum order. Use 7 integer observations in each list. Give two different compatible samples. Before calculating or constructing, choose how to test compatibility: translate the summary into ordered-position constraints and use the additional stated restrictions, or use only a proposed total/mean. Explain which information your method must check, then carry out the original construction or impossibility proof.



Lower whisker	Q1	Median	Q3	Upper whisker	Outlier marks
0	2	4	6	8	none

Five number summary	0, 2, 4, 6, 8
Quartile convention	median of halves; exclude overall median for odd n
Conditions	Use 7 integer observations in each list.

Box Plots and Outliers

Full Worked Solutions - excerpt

Worked example

Problem. The low candidates lie on opposite sides of the cutoff. For a dataset, $Q1 = 5$ and $Q3 = 9$ minutes. Under the supplied $1.5 \cdot \text{IQR}$ rule, values strictly below the lower fence or strictly above the upper fence are outliers. Classify the candidate observations $-2, -1, 5, 9$. Use the computed lower fence rather than the minimum.

$q1$	5
$q3$	9
Candidate values	$-2, -1, 5, 9$
Unit	minutes
Rule	strictly outside $Q1 - 1.5 \cdot \text{IQR}$ and $Q3 + 1.5 \cdot \text{IQR}$

Answer. classifications: (classification: low outlier; value: -2), (classification: not an outlier; value: -1), (classification: not an outlier; value: 5), (classification: not an outlier; value: 9); iqr: 4 ; lower fence: -1 ; upper fence: 15

Explanation and check.

$\text{IQR} = 4$. The lower fence is

$$5 - 1.5(4) = -1$$

and the upper fence is

$$9 + 1.5(4) = 15$$

-2 is low outlier; -1 is not an outlier; 5 is not an outlier; 9 is not an outlier. Only -2 is strictly below the lower fence -1 .

Worked example

Problem. Candidates straddle both exact cutoff values. For a dataset, $Q1 = 4$ and $Q3 = 8$ units. Under the supplied $1.5 \cdot \text{IQR}$ rule, values strictly below the lower fence or strictly above the upper fence are outliers. Classify the candidate observations $-2, -3, 14, 15$. Apply the strict signs separately on the two sides.

$q1$	4
$q3$	8
Candidate values	$-2, -3, 14, 15$
Unit	units
Rule	strictly outside $Q1 - 1.5 \cdot \text{IQR}$ and $Q3 + 1.5 \cdot \text{IQR}$

Answer. classifications: (classification: not an outlier; value: -2), (classification: low outlier; value: -3), (classification: not an outlier; value: 14), (classification: high outlier; value: 15); iqr: 4 ; lower fence: -2 ; upper fence: 14

Explanation and check.

$\text{IQR} = 4$. The lower fence is

$$4 - 1.5(4) = -2$$

and the upper fence is

$$8 + 1.5(4) = 14$$

-2 is not an outlier; -3 is low outlier; 14 is not an outlier; 15 is high outlier. The equality cases -2 and 14 are nonoutliers.

Algebra 1
Comparing Data Distributions

Comparing Data Distributions | A1-U10-P06

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
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06	Full Worked Solutions	96 solutions
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08	Terms of Use & License	included

Topic focus

Across 96 tasks this topic asks for artifact, alignment operation, and supported comparison, before/after A summaries, fixed B summaries, and revised comparison, contextual comparison of center and spread with supported limitation, chosen center and spread plus purpose-specific justification, verified shared summaries and decisive structural difference and shape label qualified by tail, modes, gaps, clusters, and evidence.

8 PDFs and a README; 136 buyer pages.

Algebra 1

Comparing Data Distributions

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.

Centers are close while spreads differ sharply. Context: part lengths. For Supplier A, the median is 100 millimeters and the IQR is 40 millimeters. For Supplier B, the corresponding values are 102 and 8 millimeters. Compare typical value and variability together, naming the groups and avoiding causal claims. Identify the more practically striking contrast.

Group	median (millimeters)	IQR (millimeters)
Supplier A	100	40
Supplier B	102	8

Bank label: _____

Higher average accompanies higher variability. Context: daily output. For Plant A, the mean is 45 units and the standard deviation is 12 units. For Plant B, the corresponding values are 38 and 5 units. Compare typical value and variability together, naming the groups and avoiding causal claims. Avoid choosing a winner without a goal.

Group	mean (units)	standard deviation (units)
Plant A	45	12
Plant B	38	5

Bank label: _____

Both groups are tightly clustered. Context: task times. For Method A, the median is 12 minutes and the IQR is 2 minutes. For Method B, the corresponding values are 25 and 3 minutes. Compare typical value and variability together, naming the groups and avoiding causal claims. Describe separation using both summaries.

Group	median (minutes)	IQR (minutes)
Method A	12	2
Method B	25	3

Bank label: _____

Average calibration agrees. Context: calibration readings. For Scale A, the mean is 200 grams and the standard deviation is 15 grams. For Scale B, the corresponding values are 200 and 4 grams. Compare typical value and variability together, naming the groups and avoiding causal claims. Use standard deviation to compare repeatability.

Group	mean (grams)	standard deviation (grams)
Scale A	200	15
Scale B	200	4

Bank label: _____

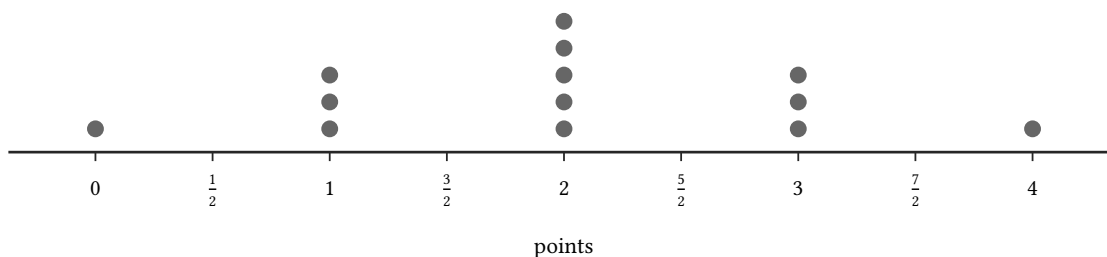
Algebra 1

Comparing Data Distributions

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 frequencies mirror around 2. An exact dot plot has horizontal values 0, 1, 2, 3, 4 and corresponding frequencies 1, 3, 5, 3, 1. Describe the supported distribution shape, including tail direction, modality, and any meaningful gap or cluster. Name the center of symmetry.



Value	Frequency
0	1
1	3
2	5
3	3
4	1

Algebra 1

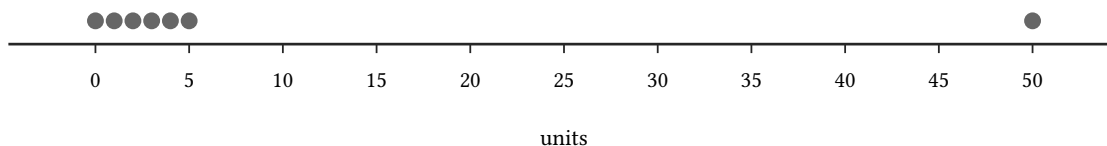
Comparing Data Distributions

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: a after: iqr: 10; mean: $\frac{52}{3}$; median: 8; n: 9; range: 100; a before: iqr: 8; mean: 7; median: 7; n: 8; range: 14; b: iqr: 10; mean: 9; median: 9; n: 9; range: 16; conclusion: Mean and range surge; the odd-sample *re-split* can also alter $Q3$ and IQR even though the new value lies far outside the middle.

A initially appears far more variable by range. Group A initially has 0, 1, 2, 3, 4, 5, 50 units; Group B has 0, 2, 4, 6, 8, 10. Remove 50 from A for a declared sensitivity analysis. Group A becomes 0, 1, 2, 3, 4, 5. Recompute A's mean, median, range, and IQR, then revise the A-versus-B comparison. Re-evaluate range and IQR rankings separately. For quartiles, use the median of each half; for odd sample sizes, exclude the overall median from both halves.



Value	Frequency
0	1
1	1
2	1
3	1
4	1
5	1
50	1

Value	Frequency
0	1
1	1
2	1
3	1
4	1
5	1

Value	Frequency
0	1
2	1
4	1
6	1
8	1
10	1

Your response: _____

Algebra 1

Comparing Data Distributions

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 classes share one typical score. Context: test scores. For Class A, the median is 70 points and the IQR is 8 points. For Class B, the corresponding values are 70 and 20 points. Compare typical value and variability together, naming the groups and avoiding causal claims. State which is more consistent.

Group	median (points)	IQR (points)
Class A	70	8
Class B	70	20

The middle-half spreads match. Context: travel times. For Route A, the median is 18 minutes and the IQR is 6 minutes. For Route B, the corresponding values are 23 and 6 minutes. Compare typical value and variability together, naming the groups and avoiding causal claims. Describe the location shift.

Group	median (minutes)	IQR (minutes)
Route A	18	6
Route B	23	6

Comparing Data Distributions

Full Worked Solutions - excerpt

Worked example

Problem. A few large observations pull the tail right. The distribution is described as strongly right-skewed with a long high-value tail. The reporting goal is to report a resistant typical value and middle spread. Choose a center/spread pair and justify its sensitivity or robustness. No formula computation is requested.

Answer. center: median; justification: Median and IQR resist the high tail better than mean and standard deviation.; spread: IQR

Explanation and check.

Use median with IQR. Median and IQR resist the high tail better than mean and standard deviation.

Worked example

Problem. Reorder one fixed multiset into two datasets that have different distribution shapes or different numbers of modes. Decide whether the requested pair can exist, and justify without inventing data.

Answer. possible: False; proof: Impossible: reordering does not change value frequencies, so the empirical distribution and its modes remain the same.

Explanation and check.

Impossible: reordering does not change value frequencies, so the empirical distribution and its modes remain the same.