Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Absolute Value, Solution Sets & Piecewise Graphs | Algebra 1 | 5-Topic Bundle

5-topic bundle | 480 problems | Four activity formats

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01 **Absolute Value Equations and Inequalities**

View individual product and its full preview

02 **Inequality Graphs and Interval Notation**

View individual product and its full preview

03 **Domain and Range**

View individual product and its full preview

04 **Absolute Value and Piecewise Function Models**

View individual product and its full preview

05 **Interpreting Piecewise Linear Graphs**

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.

40 PDFs and 5 READMEs; 354 buyer PDF pages across the 5 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

Absolute Value Equations and Inequalities

Solving Absolute Value Inequalities | A1-U03-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 exact distance condition or solution set with complete case reasoning.

8 PDFs and a README; 58 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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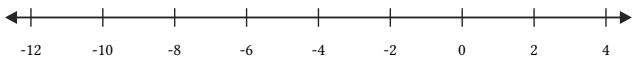
Algebra 1

Absolute Value Equations and Inequalities

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.

Reconstruct the parameterized symmetric interval. target set: $[a-r, a+r]$ with $r > 0$; form restriction: closed inside condition Bank label: _____	Construct a valid absolute-value inequality whose solution is empty. target set: empty set; form restriction: strict inside condition with radius 0 Bank label: _____
Find all x. condition: $\lvert 4x \rvert \le 12$ Bank label: _____	Find all x satisfying $\lvert 7\text{-}x \rvert = 4$. Bank label: _____
Solve and graph the result.  condition: $\left\lvert \left(\frac{1}{2}\right)x + 2 \right\rvert < 3$ Bank label: _____	Isolate and solve both branches. equation: $3\lvert -2x - 4 \rvert + 6 = 30$ Bank label: _____
Find every solution of $\lvert x - 3 \rvert = 2$. Bank label: _____	Classify and solve $\lvert x - 4 \rvert = 0$. Bank label: _____

Algebra 1

Absolute Value Equations and Inequalities

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.

Normalize the outer operations and solve.

equation: $2\,|x - 4| + 1 = 11$

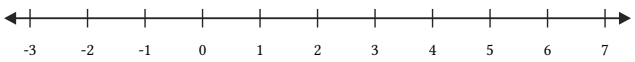
Determine the solution set without an invalid case split.

equation: $-\,2\,|x - 6| = 4$

Interpret the condition in x-units, giving its center and radius.

condition: $|2x - 6| \le 8$

Construct the required scaled condition.



membership constraints: include -1, include 5, exclude 6, both included points are endpoints, interior coefficient 2

Write the model and list ages.

context: An integer age is within 2 years of age 15, including both limits.; quantity: a years, integer

Describe $|t| = 6$ without solving it.

Algebra 1

Absolute Value Equations and Inequalities

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

Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: The solution is $-2 < x < 10$.

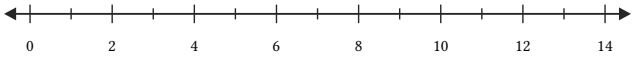
Find midpoint, radius, and the corresponding condition.

target set: $x \leq -\frac{2}{3}$ OR $x \geq \frac{10}{3}$; form restriction: closed outside condition

Your response: _____

Incoming: Use $|x - \frac{4}{3}| \geq 2$.

Use distance to solve and display the rays.

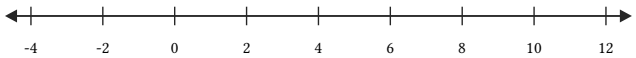


condition: $|7 - x| > 5$

Your response: _____

Incoming: The solution is $x \leq 2$ OR $x \geq 6$.

Find the open interval and mark its graph endpoints.



condition: $|-0.5x + 2| < 3$

Your response: _____

Incoming: The roots are x = -6 and $x = 4$.

Clear the outer divisor and find the closed interval.

condition: $\frac{|x-6|}{2} \leq 4$

Your response: _____

Incoming: The only solution is x = 3.

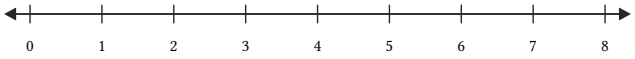
Give the exact interval.

condition: $|x - 1| \leq \frac{5}{2}$

Your response: _____

Incoming: Use $|x - 2| \leq 0.8$.

Graph and state $|x - 4| \leq 2$.



Your response: _____

Algebra 1

Absolute Value Equations and Inequalities

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.

Apply the missing contextual step.

Supplied solution steps:

1. $|t - 3| > 5$
2. $t \geq 0$ hours
3. student answer $t < -2$ or $t > 8$

Correct the center and interval.

Supplied solution steps:

1. $|x + 4| < 2$
2. student center 4
3. answer $2 < x < 6$

State and prove the containment relation.

condition A: $|x - a| \leq r$; condition B: $|x - a| \leq s$, with $0 < r < s$

Absolute Value Equations and Inequalities

Full Worked Solutions - excerpt

Worked example

Problem. Reconstruct the parameterized symmetric interval.

target set: $[a-r, a+r]$ with $r>0$; form restriction: closed inside condition

Answer. Use $|x-a| \leq r$.

Explanation and check.

The midpoint is a and the positive half-width is r.

Worked example

Problem. Construct a valid absolute-value inequality whose solution is empty.

target set: empty set; form restriction: strict inside condition with radius 0

Answer. Use $|x-1|<0$.

Explanation and check.

No distance is strictly below zero.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Inequality Graphs and Interval Notation

Inequality Graphs and Interval Notation | A1-U03-P08

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 exact equivalent set representation with endpoint evidence.

8 PDFs and a README; 64 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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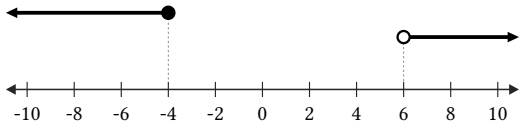
Algebra 1

Inequality Graphs and Interval Notation

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.

Although the displayed window stops at -10 and 10, arrows continue. State the full set.



Bank label: _____

Represent the singleton $\{2\}$ on a number line.

Bank label: _____

From the complete menu, list every value in the represented ray.

Use the declared universe: exhaustive menu $\{-1, 0, 3, 7\}$. The represented real set is $[3, \infty)$. The scope of the supplied evidence is exhaustive declared finite universe.

Bank label: _____

Classify exactly when these encodings agree and otherwise give a symbolic witness.

The two encodings to compare are $[a, b]$ and $[a, b)$ with $a \le b$.

Bank label: _____

Algebra 1

Inequality Graphs and Interval Notation

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.

List the integer members, preserving the open upper endpoint.

Use the declared universe: integers. The represented real set is $[-4, 3)$. The scope of the supplied evidence is all integers constrained by the bounded interval.

Construct the isolated fraction and the separate bounded interval on one exact scale.

Represent $\{-\frac{5}{2}\} \cup [\frac{1}{2}, \frac{7}{4})$ using quarter-unit ticks from -3 to 2.

Encode the union and preserve its one-point gap.

The supplied condition is $x < 2$ OR $x > 2$.

Are these sets equal? If not, exhibit a value from the differing region rather than an endpoint only.

Encoding A is $[-5, -1] \cup [2, 6]$. Encoding B is $[-5, 6]$.

Determine whether the apparent parameterized interval compression is valid.

Encoding A is $[a, b) \cup (b, c]$ with $a < b < c$. Encoding B is $[a, c]$.

Check every join before deciding whether the encodings are equivalent.

Encoding A is $[-4, -1) \cup [-1, 2) \cup \{2\}$. Encoding B is $[-4, 2]$.

Algebra 1

Inequality Graphs and Interval Notation

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

Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: The set is [0,infinity).

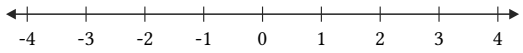
List every prime member of the represented interval.

Use the declared universe: prime integers. The represented real set is $(0, 12]$. The scope of the supplied evidence is all prime integers in the bounded interval.

Your response: _____

Incoming: The set is $\{2, 3, 5, 7, 11\}$.

The exact specification contains no shading and no isolated points. What is the set?



Your response: _____

Incoming: The set is $\{-2, -1, 0, 1, 2\}$.

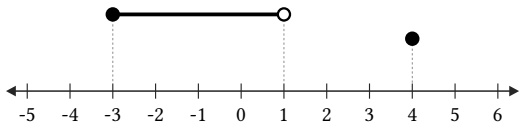
Translate $x \geq 0$ to interval notation.

The supplied condition is $x \geq 0$.

Your response: _____

Incoming: The set is $[-2, 7)$.

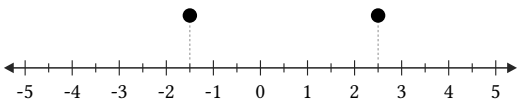
The line shades $[-3, 1)$ and separately marks 4. Encode the complete set.



Your response: _____

Incoming: The set is $\{-6, -3, 3, 6, 9\}$.

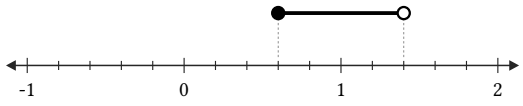
Only two filled points are shown on a half-unit scale. Encode them without shading between.



Your response: _____

Incoming: The interval is $(-1, 4)$.

The endpoints lie at the third and seventh ticks to the right of zero on *a*0.2 scale. Read coordinates, not tick numbers.



Your response: _____

Algebra 1

Inequality Graphs and Interval Notation

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.

Verify the supplied graph using boundary, interior, and exterior values.

The original condition is $-1 < x \leq 4$. The proposed representation is hollow -1, filled 4, shading between. Use the supplied checks: -1; 0; 4; 5.

Audit the proposal across all possible orderings of the real parameters.

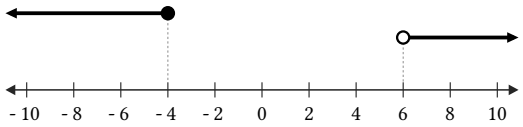
The original condition is $a \leq x \leq b$. The proposed representation is the closed segment $[a, b]$. Use the supplied checks: $a < b$; $a = b$; $a > b$.

Inequality Graphs and Interval Notation

Full Worked Solutions - excerpt

Worked example

Problem. Although the displayed window stops at -10 and 10, arrows continue. State the full set.



Answer. Use $(-\text{infinity}, -4]$ union $(6, \text{infinity})$.

Explanation and check.

Window edges are not endpoints; arrows indicate unbounded continuation.

Worked example

Problem. Represent the singleton $\{2\}$ on a number line.

Answer. Draw one filled point at 2 and no shaded segment or arrow.

Explanation and check.

A singleton contains one coordinate only, so adjacent values must stay unshaded.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Domain and Range

Domain and Range | A1-U04-P06

96 problems · Four activity formats

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Topic focus

Across 96 tasks this topic asks for justified domain or range set.

8 PDFs and a README; 60 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

Domain and Range

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.

Merge the overlapping output bands. pieces: continuous curve attaining $-3 \le y \le 2$, continuous curve attaining $1 \le y \le 6$ Bank label: _____	Read the natural graph domain. graph: $y = \sqrt{x+2}$, including endpoint $(-2, 0)$ and arrow right Bank label: _____
Map the restricted ray through h. rule: $h(x) = 3x - 2$; domain: $x \ge 1$ Bank label: _____	Project the vertical segment onto the x-axis. graph: vertical segment at $x = -4$ from $y = -2$ to $y = 6$, endpoints filled Bank label: _____
List the attained outputs from the finite restriction. rule: $r(x) = 2x$; domain: $-3, 0, 4$ Bank label: _____	Determine whether the apparent break removes an input. pieces: curve on $-4 \le x < -1$, filled point at $x = -1$, curve on $-1 < x \le 3$ Bank label: _____
Account for decreasing orientation when finding the range. rule: $g(x) = 7 - x$; domain: $-1 \le x \le 3$ Bank label: _____	Find the range with decreasing orientation and mixed endpoints. rule: $C(x) = -3x + 1$; domain: $-2 < x \le 3$ Bank label: _____

Algebra 1

Domain and Range

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.

Determine the natural domain of h. rule: $h(x) = \lvert x + 4 \rvert$	Does the formula make the cropped graph sufficient? exact rule: $f(x) = 2x + 1$ for every real x; visible window: $-2 \le x \le 2$
Separate the known full range from input evidence. known: range is exactly $[0, 10]$; two observed inputs are -1 and 4; domain: not supplied	Which complete set can be stated? known: domain is all integers; outputs observed are 2 and 5; rule: not supplied
Solve the radicand condition. rule: $u(x) = \sqrt{x - 2}$	Which projection is complete under the onto statement? known: f is onto all real outputs; observed inputs: $(0, 2)$; domain: otherwise unstated

Algebra 1

Domain and Range

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: Range $\{-3\}$ union $[0, 6]$.

Remove the undefined member of the finite domain.

rule: $S(x) = \frac{2}{x+2}$; stated domain: $-4, -2, 0, 3$

Your response: _____

Incoming: Domain $\{-4, 0, 3\}$.

Separate viewing window labels from the graph domain.

graph: filled curve only on $-2 \le x \le 2$; coordinate window and tick marks extend from -10 to 10

Your response: _____

Incoming: Range $[-4, 5]$.

Unite repeated vertical bands and the isolated value.

pieces: segment with range $[0, 4]$, arc with range $[2, 6]$, point at height -3

Your response: _____

Incoming: Use x in $(-2, 3]$.

Reverse the inequality when solving the radicand condition.

rule: $J(x) = \sqrt{8 - 2x}$

Your response: _____

Incoming: Domain (−infinity,5].

Account for an endpoint height restored elsewhere.

graph: vertical segment with open endpoints $y = -3$ and $y = 5$, plus a filled point at $y = -3$ elsewhere

Your response: _____

Incoming: The domain is $[-2, 4]$.

What output set does the square-root graph attain?

graph: $y = \sqrt{x + 2}, x \ge -2$

Your response: _____

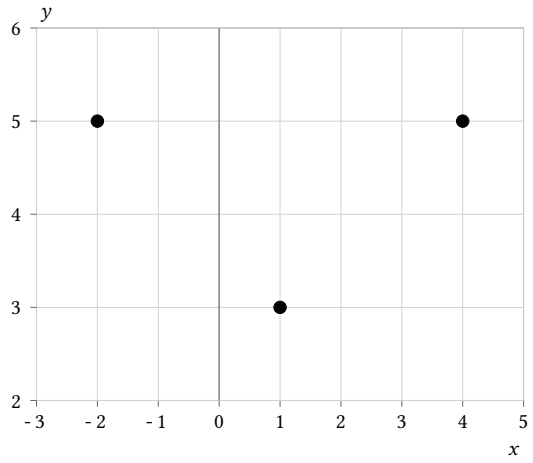
Algebra 1

Domain and Range

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.

Correct the swapped projections.



Supplied solution steps:
1. domain $\{3, 5\}$
2. range $\{-2, 1, 4\}$

Audit the unattained codomain label.

declaration: $f\colon\{a, b\} \to \{1, 2, 3\}$; values: $f(a) = 1$, $f(b) = 3$
Supplied solution steps:
1. range $\{1, 2, 3\}$

Domain and Range

Full Worked Solutions - excerpt

Worked example

Problem. Merge the overlapping output bands.

pieces: continuous curve attaining -3 ≤ $y \le 2$, continuous curve attaining $1 \le y \le 6$

Answer. Range $[-3, 6]$.

Explanation and check.

The bands overlap from 1 through 2, so their union has no vertical gap.

Worked example

Problem. Read the natural graph domain.

graph: $y = \sqrt{x + 2}$, including endpoint $(-2, 0)$ and arrow right

Answer. Domain $[-2$,infinity).

Explanation and check.

The square-root graph starts at included input -2 and continues right.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Absolute Value and Piecewise Function Models

Piecewise Functions: Modeling | A1-U04-P09

96 problems · Four activity formats

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Topic focus

Across 96 tasks this topic asks for verified conditional rule, value, graph, or model.

8 PDFs and a README; 67 buyer pages.

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Algebra 1

Absolute Value and Piecewise Function Models

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.

Admission is free for ages under 4, \$5 for ages 4 through 12, and \$9 for ages over 12. Model price $P(a)$ for nonnegative age a. Bank label: _____	A process score starts at 100 and loses 4 points for each degree T differs from the 22°C target. Write the score model. Bank label: _____
Arriving exactly at 9:00 earns 15 points. One point is lost per minute early or late. Let m be signed minutes after 9:00. Model $P(m)$. Bank label: _____	Let $G(x) = x^2$ for $x < -3$, $G(x) = x + 8$ for $-3 \le x \le 2$, and $G(x) = 1\text{-}x$ for $x > 2$. Evaluate $G(-3)$. Bank label: _____
A rule uses $mx + 1$ for $x \le 2$ and the constant 7 for $x > 2$. Find m so both formulas have the same joining value. Bank label: _____	For $F(x) = 2x + 1$ if $x < -2$, $F(x) = 7$ if $-2 \le x < 4$, and $F(x) = x^2$ if $x \ge 4$, find $F(1)$. Bank label: _____
A ranger starts at trail coordinate 6 km and walks at $4\frac{km}{h}$ in either direction. Model travel time to coordinate x. Bank label: _____	Let $s(x) = 4x$ for $x < 5$ and $s(x) = x - 6$ for $x \ge 5$. Find $s(5)$. Bank label: _____

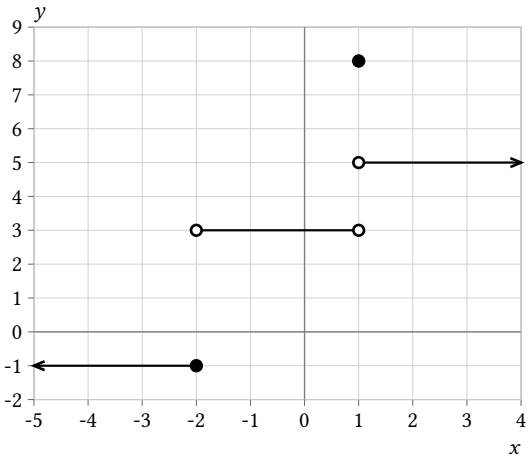
Algebra 1

Absolute Value and Piecewise Function Models

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.

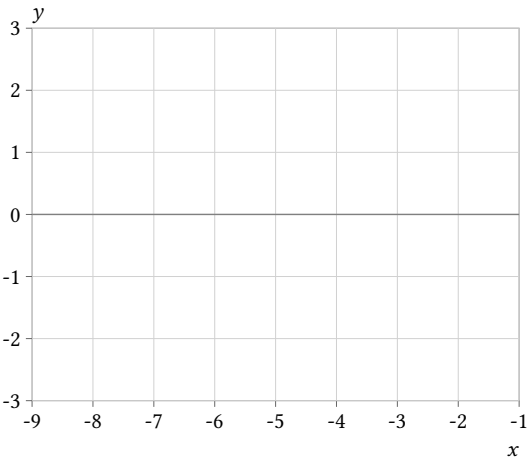
A step graph is $y = -1$ on $x \le -2$, $y = 3$ on $-2 < x < 1$, $y = 8$ only at $x = 1$, and $y = 5$ on $x > 1$. Encode it.



A rule uses $t(x) = 4\text{-}x$ for $x \le 0$ and $t(x) = x + 6$ for $x \ge 0$, producing two outputs at zero. Change only one condition endpoint to make a real-domain function while preserving $t(0) = 4$.

Conditions are $x < -4$, $-4 \le x < 1$, and $x > 1$. If each has one formula, what is the actual domain and what happens at $x = 1$?

Construct $L(x) = -|x + 5| + 2$ only for $x \le -5$.



Algebra 1

Absolute Value and Piecewise Function Models

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: Use $E(T) = 0.2 + 0.05\lvert T - 18\rvert$ for $5 \le T \le 30$. Define $U(x) = x^2 + 2$ for $x < -1, U(x) = 3x$ for $-1 \le x < 4$, and $U(x) = 10\text{-}x$ for $x \ge 4$. Find $U(-2)$ and $U(4)$. Your response: _____	**Incoming:** The requested values are $U(-2) = 6$ and $U(4) = 6$. A function uses $7 - 2x$ for $x \le 4$ and $mx - 5$ for $x > 4$. Determine m for equal values at the join. Your response: _____
Incoming: The delay model is $D(h) = 2\lvert h\rvert$ minutes. A sensor error is 0.2 plus 0.05 per degree away from 18°C, and the sensor is used only for $5 \le T \le 30$. Model error with its domain. Your response: _____	**Incoming:** The alarm index is $A(e) = 1 + 0.04\lvert e - 250\rvert$. A function Q is $x + 1$ on $x < 0$, 4 on $0 < x < 3$, and $x - 2$ on $x \ge 3$. What is $Q(0)$? Your response: _____
Incoming: The value is $v(-6) = 5$. A rule lists $L(x) = x - 1$ for $x \ge 4$ first, then $L(x) = 2x + 3$ for $x < 4$. Evaluate $L(-2)$. Your response: _____	**Incoming:** The required scale is k = 2. Define $J(x) = -x^2$ for $x \le -2$ and $J(x) = 3x + 1$ for $x > -2$. Evaluate $J(-4)$. Your response: _____

Algebra 1

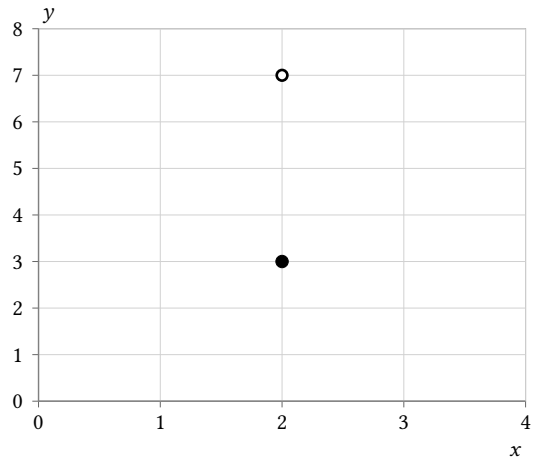
Absolute Value and Piecewise Function Models

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

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

For $f(x) = 2x$ for $x < 3$ and $f(x) = x + 5$ for $x \geq 3$, a student reports $f(3) = 6$. Diagnose and repair.

A graph has an open point $(2, 7)$ from one branch and a closed point $(2, 3)$ from another. A solution states $f(2) = 7$. Correct it.



Absolute Value and Piecewise Function Models

Full Worked Solutions - excerpt

Worked example

Problem. Admission is free for ages under 4, \$5 for ages 4 through 12, and \$9 for ages over 12. Model price $P(a)$ for nonnegative age a.

Answer. Use $P(a) = 0$ for $0 \le a < 4, P(a) = 5$ for $4 \le a \le 12$, and $P(a) = 9$ for $a > 12$.

Explanation and check.

The age thresholds determine three constant branches and both stated equality owners.

Worked example

Problem. A process score starts at 100 and loses 4 points for each degree T differs from the 22 °C target. Write the score model.

Answer. The score is $S(T) = 100 - 4|T - 22|$.

Explanation and check.

Absolute value measures unsigned distance from 22, and the negative rate lowers the baseline score.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Interpreting Piecewise Linear Graphs

Graphing Piecewise-Defined Functions | A1-U04-P12

96 problems · Four activity formats

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

Topic focus

Across 96 tasks this topic asks for exact behavior intervals, features, construction, or justified conclusion.

8 PDFs and a README; 105 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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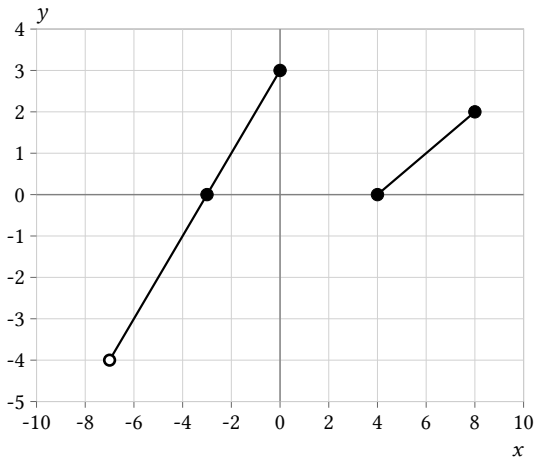
Algebra 1

Interpreting Piecewise Linear Graphs

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

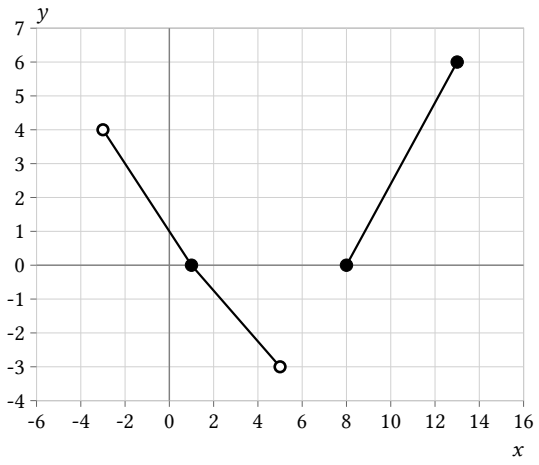
Answer each question and record the matching bank letter. Give exact values. A value without its unit is not a complete answer.

Use the stated line segments, not a sketch estimate: component 1: connect $(-7, -4)$ to $(-3, 0)$ to $(0, 3)$; its left endpoint is open and right endpoint is included; component 2: connect $(4, 0)$ to $(8, 2)$; its left endpoint is included and right endpoint is included. List all x-intercepts and the y-intercept, if each exists.



Bank label: _____

Read output sign, not direction of travel, from: component 1: connect $(-3, 4)$ to $(1, 0)$ to $(5, -3)$; its left endpoint is open and right endpoint is open; component 2: connect $(8, 0)$ to $(13, 6)$; its left endpoint is included and right endpoint is included. State where $f(x)$ is positive, negative, and zero.



Bank label: _____

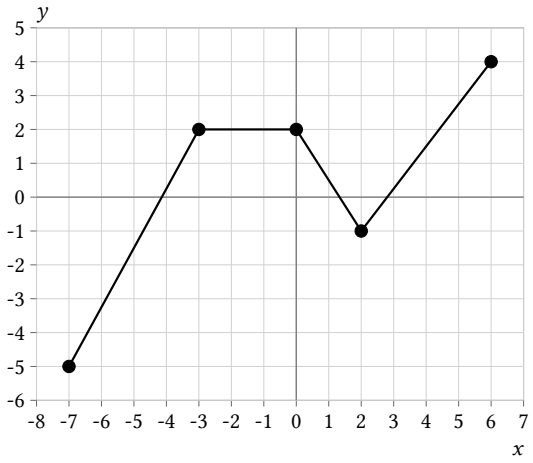
Algebra 1

Interpreting Piecewise Linear Graphs

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

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

Use these exact vertices and no points in any domain gap: connect $(-7, -5)$ to $(-3, 2)$ to $(0, 2)$ to $(2, -1)$ to $(6, 4)$; its left endpoint is included and right endpoint is included. List the input intervals where the function is increasing, decreasing, or constant.



The function graph has the following exact connected pieces: connect $(1, 3)$ to $(4, 0)$ to $(8, -5)$; its left endpoint is included and right endpoint is included. List all x-intercepts and the y-intercept, if each exists.

Algebra 1

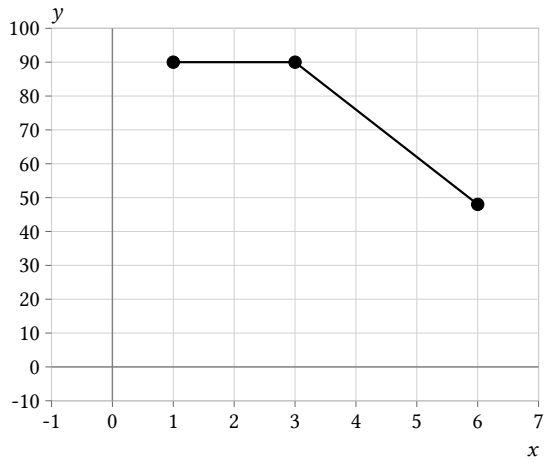
Interpreting Piecewise Linear Graphs

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

Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: The global maximum is 3 at $x = 2$, and the global minimum is -5 at $x = -3$.

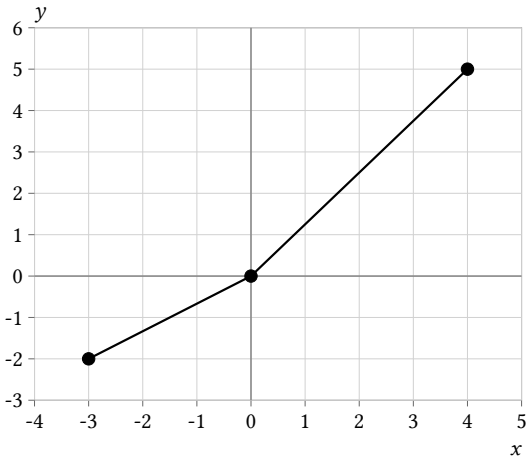
A graph shows inventory $I(d)$ in boxes at the end of day d by connecting $(1, 90), (3, 90), (6, 48)$ in order. Interpret the first segment and the later decrease.



Your response: _____

Incoming: Inventory stays at 90 boxes from day 1 through day 3, then falls to 48 boxes by day 6.

Determine both kinds of axis intercept from this exact graph: connect $(-3, -2)$ to $(0, 0)$ to $(4, 5)$; its left endpoint is included and right endpoint is included. List all x-intercepts and the y-intercept, if each exists.



Your response: _____

Algebra 1

Interpreting Piecewise Linear Graphs

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

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

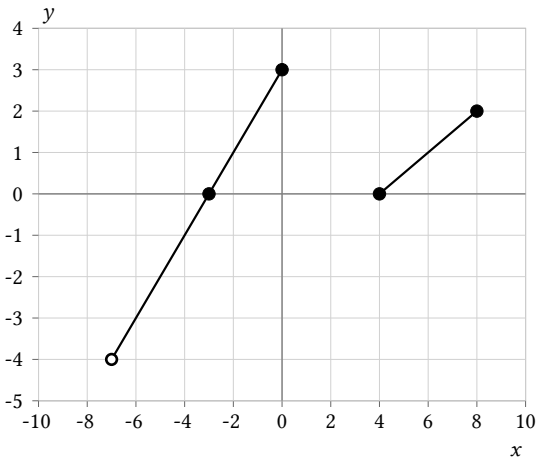
Audit this qualitative analysis: A graph rises from $(-5, -4)$ to $(2, 6)$. A student reports that it increases on $-4 < y < 6$. Correct the claim.

Interpreting Piecewise Linear Graphs

Full Worked Solutions - excerpt

Worked example

Problem. Use the stated line segments, not a sketch estimate: component 1: connect $(-7,-4)$ to $(-3,0)$ to $(0,3)$; its left endpoint is open and right endpoint is included; component 2: connect $(4,0)$ to $(8,2)$; its left endpoint is included and right endpoint is included. List all x-intercepts and the y-intercept, if each exists.



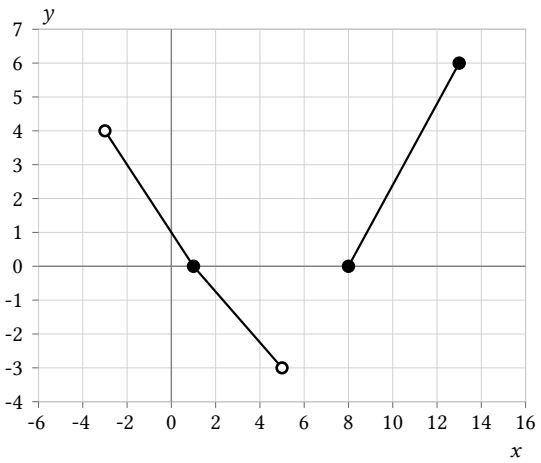
Answer. x-intercept set: $(-3,0),(4,0)$; y-intercept: $(0,3)$. The exact domain is $(-7,0]$ union $[4,8]$.

Explanation and check.

Use the exact segment equations implicit in the listed vertices for crossings, and retain only included points at either axis.

Worked example

Problem. Read output sign, not direction of travel, from: component 1: connect $(-3,4)$ to $(1,0)$ to $(5,-3)$; its left endpoint is open and right endpoint is open; component 2: connect $(8,0)$ to $(13,6)$; its left endpoint is included and right endpoint is included. State where $f(x)$ is positive, negative, and zero.



Answer. Positive on $(-3,1),(8,13]$; negative on $(1,5)$; zero on $x=1, x=8$.

Explanation and check.

Direction of travel is irrelevant here: only being above, on, or below $y=0$ determines positive, zero, or negative output.