Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Linear Equations, Inequalities & Functions | Algebra 1 | 30-Topic Bundle

30-topic bundle | 2,880 problems | Four activity formats

Included topics

The following pages list all 30 included resources in the suggested order, with a link to each product. Each resource retains its complete preview.

In every topic

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

Product previews

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

240 PDFs and 30 READMEs; 1,974 buyer PDF pages across the 30 products.

Preview pages are not included in the buyer page count. Check the list against resources you already own.

This is a fixed collection of the listed products. Purchase includes the existing individual resource files. To open a product's online preview, follow its title link and select View Preview.

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Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Included topics

30-topic bundle | 2,880 problems | Four activity formats

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30 included resources | Complete resource previews follow this guide.

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Sets & Steps
Math Practice & Worked Solutions

Algebra 1

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12 **Compound Inequalities**

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13 **Relations and Mapping Diagrams**

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14 **Is It a Function**

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15 **Interpreting Function Notation**

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16 **Evaluating Functions from Representations**

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17 **Finding Inputs from Function Outputs**

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18 **Domain and Range**

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19 **Average Rate of Change in Context**

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20 **Slope from Two Points**

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21 **Slope from Tables and Graphs**

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22 **Positive, Negative, Zero, and Undefined Slope**

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Algebra 1

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23 **Interpreting Slope-Intercept Form**

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25 **Solving Systems by Graphing**

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26 **Number of Solutions in Linear Systems**

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27 **Solving Systems by Substitution**

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28 **Solving Systems by Elimination**

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29 **Choosing a Method for Linear Systems**

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Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Equality and One-Step Additive Equations

Equality and One-Step Additive Equations | A1-U02-COMB-P01-P02

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for checked solution audit, completed equation, constant with verification, contextual solution and check, effect of constant changes and equivalent transformed equation and inverse.

8 PDFs and a README; 54 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.

Published by Tusils LLC.

Algebra 1

Equality and One-Step Additive Equations

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.

Interpret the statement $3 + 5 = 8$. Decide whether it is true, compare the values of the two complete sides, and explain what the equals sign asserts without describing it as an instruction to compute the right side.

Bank label: _____

Interpret the statement $3 + 4 = 8$. Decide whether it is true, compare the values of the two complete sides, and explain what the equals sign asserts without describing it as an instruction to compute the right side.

Bank label: _____

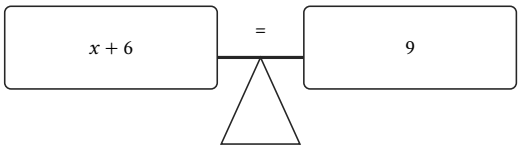
Under the stated domain $[-2, -1, 0, 1, 2]$, compare the complete solution sets of $x = 2$ and $(x - 2)(x + 1) = 0$. Use direct membership or the supplied finite domain rather than visual similarity, then state whether the equations are equivalent.

Given domain: $[-2, -1, 0, 1, 2]$

x	Equation 1	Equation 2
-2	not a solution	not a solution
-1	not a solution	solution
0	not a solution	not a solution
1	not a solution	not a solution
2	solution	solution

Bank label: _____

Starting from $x + 6 = 9$, add 7 to both sides. Write the resulting equation with the operation applied to each complete side, state the inverse operation, and explain why the transformation preserves the full solution set.



Bank label: _____

Algebra 1

Equality and One-Step Additive Equations

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.

Diagnose the proposed transformation $x + 3 = 7 \rightarrow x + 4 = 7$. Decide whether it preserves the full solution set, identify the reversibility or information-loss mechanism, and give a value witnessing any lost or newly admitted solution.	Compare the complete equations $x + 2 = 5$ and $x + 5 = 8$. Recover one reversible operation applied to both sides that connects them, or explain why no single operation from the stated families can work. Verify by applying your proposal to both complete sides.
Justify the transition $2x + 6 = 8 \rightarrow 8 = 2x + 6$. Identify every change, distinguish a same-operation-on-both-sides step from value-preserving rewriting within one side, and name the inverse when an equation operation is used.	Under the stated domain all real x, compare the complete solution sets of $x + 1 = 3$ and $2x + 2 = 6$. Use direct membership or the supplied finite domain rather than visual similarity, then state whether the equations are equivalent.
For the original equation $2x + 3 = -5$, verify each candidate $[-4, -3]$ by substitution. Evaluate the complete left and right sides separately and classify each value as a solution or non-solution; do not solve the equation by a general procedure.	Starting from $x + 2 = 5$, add 3 to both sides. Write the resulting equation with the operation applied to each complete side, state the inverse operation, and explain why the transformation preserves the full solution set.

Algebra 1

Equality and One-Step Additive Equations

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: -17 Complete $k - x = 7$ so its solution is $x = -4$. Find k, explain the signed arithmetic, and verify uniqueness. Your response: _____	**Incoming:** 3 A situation is represented by $45 - r = 17$, where r is the water removed from a tank measured in liters. Solve the supplied equation and interpret r with its unit. Your response: _____
Incoming: 17 What value of k makes 11 satisfy $k + x = -6$? Substitute the target first, then check the resulting equation. Your response: _____	**Incoming:** 14 A constant edit changes the first equation $x + \frac{1}{2} = \frac{5}{2}$ into the comparison equation $y + \frac{3}{4} = \frac{5}{2}$. Describe the resulting solution change and verify both values. Your response: _____
Incoming: 11 liters Read tau + 1.75 = 6.5 as an additive equation for the time already spent before another 1.75 hours. Solve for tau, attach the unit hours, and test the value in the equation. Your response: _____	**Incoming:** 5 Isolate t in $t + (-6) = 15$, and state the inverse additive move you used. Your response: _____

Algebra 1

Equality and One-Step Additive Equations

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.

Examine the proposed reasoning for $n - 9 = -4$: $n - 9 + 9 = -4$; $n = -4$. Decide whether equality was preserved; then state and check the correct result.

A student solves $x + 7 = 19$ with these steps: $x + 7 - 7 = 19 + 7$; $x = 26$. Audit the work, identify the first issue if any, give the corrected solution, and verify it.

For the equation $t + (-6) = 15$, a solution record reads $t = 15 - 6$; $t = 9$. Diagnose the inverse-operation reasoning and repair the conclusion when necessary.

Examine the proposed reasoning for $a + \frac{11}{12} = -\frac{1}{3}$: $a = -\frac{1}{3} - \frac{11}{12}$; $a = \frac{7}{12}$. Decide whether equality was preserved; then state and check the correct result.

Equality and One-Step Additive Equations

Full Worked Solutions - excerpt

Worked example

Problem. Interpret the statement $3 + 5 = 8$. Decide whether it is true, compare the values of the two complete sides, and explain what the equals sign asserts without describing it as an instruction to compute the right side.

Answer. true; both sides name the same value

Explanation and check.

The complete left value and complete right value are both 8.

Worked example

Problem. Interpret the statement $3 + 4 = 8$. Decide whether it is true, compare the values of the two complete sides, and explain what the equals sign asserts without describing it as an instruction to compute the right side.

Answer. false; the side values differ

Explanation and check.

The left side is 7, while the right side is 8.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

One-Step Multiplication and Division Equations

One-Step Multiplication and Division Equations | A1-U02-P03

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for allowable scale with restriction, coefficient effect with signs, completed multiplicative equation, contextual exact solution, equivalent operations and solution and exact value with substitution.

8 PDFs and a README; 48 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

One-Step Multiplication and Division Equations

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.

Find x in $-12x = -192$ with exact arithmetic; include the original-equation verification. Bank label: _____	Use a reciprocal operation to isolate x in $\frac{x}{7} = -3$. State the exact solution and a check. Bank label: _____
Read $(\frac{11}{8})u = \frac{33}{4}$ as a supplied multiplicative relation for the original length under an improper fraction scale. Determine u in meters and verify. Bank label: _____	Determine the unique solution of $5x = 50$. Name the inverse multiplicative step you use. Bank label: _____
For the template $\frac{x}{a} = -7$, make $x = -21$ work. Check the nonzero restriction on the coefficient or divisor. Bank label: _____	Rewrite $\frac{x}{-8} = \frac{5}{8}$ with x alone by applying an equivalent reciprocal step to both sides. Bank label: _____
Reverse the coefficient-solving task: $ax = 35$ is required to have target -5. Find the missing data and test admissibility. Bank label: _____	Solve $(\frac{3}{4})x = \frac{15}{8}$ and verify the value in the original equation. Bank label: _____

Algebra 1

One-Step Multiplication and Division Equations

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 equation display is $0x = 9$. A solver proposes to divide both sides by 0. Is that operation permitted? Explain by inspecting the proposed divisor.	Before solving $7x = 0$, assess the step 'divide both sides by 7'. Distinguish a zero coefficient from a zero right side.
Read $(\frac{2}{3})a = 14$ as a supplied multiplicative relation for the original measure from a two-thirds portion. Determine a in meters and verify.	For $0x = -4$, decide whether the proposed step "multiply both sides by $\frac{1}{0}$" is permitted. State the inverse restriction without doing a full solution-set classification.
Two solvers attack $(-\frac{2}{5})x = -6$. One will divide both sides by $-\frac{2}{5}$; the other will multiply both sides by $-\frac{5}{2}$. Explain their equivalence and finish the solution.	For the pair $3x = 36$ and $9y = 36$, determine the order of x and y. Qualify your reasoning using the coefficient signs.

Algebra 1

One-Step Multiplication and Division Equations

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: $x < y$; $-8 < 4$ A coefficient changes while the product side stays 15: $1.5x = 15$; $2.5y = 15$. Compare the solutions and verify. Your response: _____	**Incoming:** $x > y$; $10 > 6$ The equation is $(-\frac{11}{6})x = -22$. Compare division by the coefficient with multiplication by its reciprocal, then report the checked value of x. Your response: _____
Incoming: a = -4 Without assuming that a larger coefficient always means a smaller signed solution, compare $-5x = 40$ with $10y = 40$. Your response: _____	**Incoming:** $-\frac{52}{5}$ Find x in $(\frac{4}{11})x = \frac{60}{77}$ with exact arithmetic; include the original-equation verification. Your response: _____
Incoming: 30 liters Use the given grouping equation $-0.4s = 3.2$. The variable s is the signed time under a negative change rate, measured in seconds; find and check it. Your response: _____	**Incoming:** 9 Reverse the nonzero scaling in $\frac{x}{-7} = 1$, then confirm both sides agree. Your response: _____

Algebra 1

One-Step Multiplication and Division Equations

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 work for $4x = 28$: $x = \frac{28}{4}$; $x = 7$. Identify the first invalid reciprocal or division step, repair it, and verify.

Diagnose the multiplicative reasoning in $\frac{x}{5}$ times $5 = -4$; $x = -4$ for $\frac{x}{5} = -4$. Name any sign or reciprocal error and correct the result.

Someone claims $x = \frac{7}{-4}$; $x = -\frac{7}{4}$ solves $\frac{x}{-4} = 7$. Locate a one-sided, inverse, or sign mistake if present and verify the repaired answer.

Check the equality logic used on $(\frac{5}{8})x = -15$: $x = -15$ times $\frac{8}{5}$; $x = -24$. Report the first issue or defend the method, then substitute the conclusion.

One-Step Multiplication and Division Equations

Full Worked Solutions - excerpt

Worked example

Problem. Find x in $-12x = -192$ with exact arithmetic; include the original-equation verification.

Answer. 16

Explanation and check.

Undo the multiplier -12 on both sides. This isolates x at 16; the original relation checks.

Worked example

Problem. Use a reciprocal operation to isolate x in $\frac{x}{7} = -3$. State the exact solution and a check.

Answer. -21

Explanation and check.

Apply the reciprocal of the effective scale to the full equality. The result is $x = -21$, and substitution reproduces -3.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Two-Step Equations

Two-Step Equations | A1-U02-P04

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for exact value and verification, exact value with inverse order, exact value with unit and contextual check, first invalid step, corrected solution, and check, input, reverse path, and forward check and parameter value or feasibility classification.

8 PDFs and a README; 50 buyer pages.

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Algebra 1

Two-Step Equations

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.

Isolate x in $-2x + 9 = -3$, preserving the equality at every step. Bank label: _____	Use this operation diagram: input x → multiply by 3 → add 5 → output 17. Traverse the arrows backward to recover x, then run the machine forward as a check. Bank label: _____
Determine the value of x that makes $7x + 2 = -19$ true. Show the two inverse operations. Bank label: _____	Isolate x in $2x + 11 = 25$, preserving the equality at every step. Bank label: _____
Complete $5(-3) + k = -22$ so that the prescribed input $x = -3$ works. Determine k and verify the resulting equality. Bank label: _____	Without skipping the check, solve $5x + 15 = 15$ and explain whether $x = 0$ works. Bank label: _____
Solve $9(x - 5) = -27$ by reversing the outer operation before the inner shift. Bank label: _____	Isolate x in $(-\frac{7}{4})x + \frac{2}{3} = \frac{25}{6}$, preserving the equality at every step. Bank label: _____

Algebra 1

Two-Step Equations

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.

Solve $-3x - 6 = -24$. Keep the result exact and verify it in the original equation.	Solve $8x - 5 = -29$. Keep the result exact and verify it in the original equation.
The complete rule is input $x \to$ multiply by $-4 \to$ add $7 \to$ output 19. What input produced the stated output? Include the intermediate value in your verification.	Use the given equation $64 - 5x = 24$ for this initial-minus-use situation: x measures operating intervals in hours; 64 is the initial amount and 5 is removed per unit of x. Recover x and explain both inverse steps.
The conversion rule has already been modeled as $(\frac{9}{5})x + 32 = 77$; x is the input temperature; the conversion multiplies by $\frac{9}{5}$ and then shifts by 32. Find the source value x in degrees and check by converting forward.	Solve $-5(x - 4) = 35$ by reversing the outer operation before the inner shift.

Algebra 1

Two-Step Equations

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: -23

A two-stage machine applies 'divide by 4' and then 'add 3'. Its output is 5. Recover the input and list the inverse steps in reverse order.

Your response: _____

Incoming: 8

The complete rule is input $x \to$ multiply by $\frac{1}{2} \to$ add $-3 \to$ output 2. What input produced the stated output? Include the intermediate value in your verification.

Your response: _____

Incoming: $\frac{23}{6}$

What value of x satisfies $\frac{x+2}{7} = -3$? Show how the grouped quantity is isolated first.

Your response: _____

Incoming: $\frac{7}{4}$

Complete $\frac{\frac{11}{6} - \frac{5}{4}}{d} = \frac{7}{3}$ so that the prescribed input $x = \frac{11}{6}$ works. Determine d and verify the resulting equality.

Your response: _____

Incoming: $\frac{8}{3}$

Use this operation diagram: input $x \to$ add 9 $\to$ divide by $-5 \to$ output -2. Traverse the arrows backward to recover x, then run the machine forward as a check.

Your response: _____

Incoming: 4

Determine the value of x that makes $4x - 7 = 13$ true. Show the two inverse operations.

Your response: _____

Algebra 1

Two-Step Equations

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 $(\frac{3}{2})(x+4)=\frac{15}{2}$, Route A would multiply both sides by the reciprocal $\frac{2}{3}$ to isolate the group. Route B would split the rational scale into numerator and denominator and undo those two factors separately. Carry out both valid routes, compare their intermediate arithmetic, and solve.

Two valid plans for $(\frac{5}{3})(x-2)=\frac{20}{3}$ are: A—multiply both sides by the reciprocal $\frac{3}{5}$ to isolate the group; B—split the rational scale into numerator and denominator and undo those two factors separately. Decide which better exposes the grouped quantity here and verify the common solution.

Inspect $\frac{x+5}{\frac{7}{4}}=-\frac{21}{4}$. Compare the valid full-group route (multiply both sides by the full divisor $\frac{7}{4}$) with the factor-by-factor route (rewrite division by the rational number as reciprocal multiplication, then undo that multiplier); report x and the cleaner route.

For $(-\frac{3}{2})(x+6)=9$, Route A would multiply both sides by the reciprocal $-\frac{2}{3}$ to isolate the group. Route B would split the rational scale into numerator and denominator and undo those two factors separately. Carry out both valid routes, compare their intermediate arithmetic, and solve.

Two-Step Equations

Full Worked Solutions - excerpt

Worked example

Problem. Isolate x in $-2x + 9 = -3$, preserving the equality at every step.

Answer. 6

Explanation and check.

First undo the full offset: the variable term equals -12. Its effective coefficient is -2, so division gives $x = 6$. Substitution in $-2x + 9 = -3$ reproduces -3.

Worked example

Problem. Use this operation diagram: input $x \to$ multiply by $3 \to$ add $5 \to$ output 17. Traverse the arrows backward to recover x, then run the machine forward as a check.

Answer. 4

Explanation and check.

Starting at 17, subtract 5 gives the prior stage value 12; then divide by 3 gives $x = 4$. Forward verification applies multiply by 3 and add 5 and returns 17.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Equations with the Distributive Property

Equations with the Distributive Property | A1-U02-P05

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for distribution, combined coefficient, exact solution, and check, equivalence classification, operation validity, and proof, first error, corrected equation, solution, and original-form check, missing value or feasibility classification with verification, recovered data or inconsistency proof with term matching and strategy justification, exact solution, and check.

8 PDFs and a README; 49 buyer pages.

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Algebra 1

Equations with the Distributive Property

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.

The target solution $x = 4$ must satisfy $3(2x + b) - x = 35$. Recover the missing inside constant b, classify uniqueness, and verify. Bank label: _____	Substitute $x = -3$ into the incomplete grouped equation $m(2x + 4) + x = 1$. Determine m and check the completed original form. Bank label: _____
Choose k so that $x = 5$ satisfies $2(kx + 3) - 4x = 16$. Keep the group intact during substitution, then test the result. Bank label: _____	Expand the grouped side of $-3(4x + 6) - 5x = 101$, solve the resulting linear equation, and verify in the unexpanded equation. Bank label: _____
Solve $5(4x - 9) - 8x = -21$. Distribute across every complete group before combining the exposed variable terms, then check the original form. Bank label: _____	Expand the grouped side of $-7(2x + 1) + 5x = -43$, solve the resulting linear equation, and verify in the unexpanded equation. Bank label: _____
In $6(3x - 4) - 11x = -45$, the grouped variable contribution interacts with an outside variable term. Expose that interaction and solve exactly. Bank label: _____	Track every sign while solving $4(-2x + 7) + 5x = 46$; state the net coefficient after distribution and confirm the answer in the original groups. Bank label: _____

Algebra 1

Equations with the Distributive Property

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 x in $2x - 3(4x - 7) = 1$. Show the distribution step and the combined coefficient before isolating x.	For $-4(3x - 2) = 68$, decide whether expansion is useful or whole-group isolation is cleaner. Support the choice with a complete solution and check.
Check the stated algebraic move from $5(-x + 7) + 2x = 17$ to $-10x + 70 + 4x = 34$. Decide whether one common nonzero operation reaches every term and whether the equations are equivalent.	Analyze the structure of $5(-x + 7) = 5$. Explain how the placement of every variable term controls the choice between distribution and group isolation, then solve.
Compare the original grouped equation $-2(-3x + 4) - 5x = 0$ with the candidate intermediate $6x - 8 - 5x = 0$. Are they equivalent, and does full distribution justify the displayed line?	The template $-6(x + b) + 4x = 30$ is said to produce the expanded intermediate $-6x + 48 + 4x = 30$. Recover inside constant b, reconstruct the original, and solve it.

Algebra 1

Equations with the Distributive Property

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: $\frac{11}{4}$ Substitute $x = -5$ into the incomplete grouped equation $m((\frac{3}{2})x - \frac{7}{3}) + (\frac{4}{5})x = -\frac{209}{8}$. Determine m and check the completed original form. Your response: _____	**Incoming:** $\frac{9}{4}$ Track every sign while solving $5(-3x + 4) + 2x = 33$; state the net coefficient after distribution and confirm the answer in the original groups. Your response: _____
Incoming: 9 The target solution $x = 7$ must satisfy $5(-2x + b) + 3x = -\frac{141}{4}$. Recover the missing inside constant b, classify uniqueness, and verify. Your response: _____	**Incoming:** 4 Complete the grouped equation $(\frac{7}{4})((\frac{2}{3})x + b) - (\frac{5}{6})x = -\frac{493}{180}$ for the prescribed solution $x = -\frac{9}{5}$. Explain why the missing data are or are not uniquely determined. Your response: _____
Incoming: 1 In $4(3x + 2) - 7x = -22$, the grouped variable contribution interacts with an outside variable term. Expose that interaction and solve exactly. Your response: _____	**Incoming:** $-\frac{4}{7}$ In $4(-x + 6) + 3x = 19$, the grouped variable contribution interacts with an outside variable term. Expose that interaction and solve exactly. Your response: _____

Algebra 1

Equations with the Distributive Property

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 work for $3(2x+5)-x=35$: $6x+5-x=35$; $5x=30$; $x=6$. Identify the first incorrect distributed term, repair the equation, and verify the solution.

Track the signed distribution in $-2(3x-4)+x=23$. The proposed work is $-6x-8+x=23$; $-5x=31$; $x=-\frac{31}{5}$. Diagnose its first sign error and give the checked value of x.

Audit this work for $4(6-x)+3x=19$: $24-x+3x=19$; $2x=-5$; $x=-\frac{5}{2}$. Identify the first incorrect distributed term, repair the equation, and verify the solution.

Review the constant contribution in the attempted solution of $5(2x-3)-4x=-27$: $10x-3-4x=-27$; $6x=-24$; $x=-4$. Locate the distribution error and solve correctly.

Equations with the Distributive Property

Full Worked Solutions - excerpt

Worked example

Problem. The target solution $x = 4$ must satisfy $3(2x + b) - x = 35$. Recover the missing inside constant b, classify uniqueness, and verify.

Answer. 5

Explanation and check.

Replace x by 4 while retaining the group. After substituting the target, the remaining nonzero coefficient on b determines $b = 5$ uniquely. Rechecking the completed group at the target confirms the unique result.

Worked example

Problem. Substitute $x = -3$ into the incomplete grouped equation $m(2x + 4) + x = 1$. Determine m and check the completed original form.

Answer. -2

Explanation and check.

At $x = -3$, first evaluate the known inside quantity and the outside x-term. After substituting the target, the remaining nonzero coefficient on m determines $m = -2$ uniquely. A direct substitution check confirms the recovered factor condition.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Equations with Like Terms

Equations with Like Terms | A1-U02-P06

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for cancelled pair, surviving term, exact solution, and check, first invalid step, corrected grouping, solution, and check, missing value or identifiability classification with check, net coefficient, exact solution, and verification, route validity, efficiency, exact solution, and check and separate totals, exact solution, and verification.

8 PDFs and a README; 49 buyer pages.

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Algebra 1

Equations with Like Terms

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.

In $x + 4x - 2x - 6 = 3$, include every implicit or fractional coefficient when collecting like terms. What is x? Bank label: _____	Solve $3x + 7 + 5x - 4 - 2x + 9 = 36$ by collecting variable terms and constant terms as two separate groups. Show both totals and verify. Bank label: _____
Substitute $x = -3$ into $-2x + 7 + 5x + d = -6$, then determine the missing constant d. Check the completed equation in its original order. Bank label: _____	Some constants or coefficients in $6x - 8 - x + 3 + 3x + 5 = 16$ cancel. Identify only the true inverse pairs, then solve the reduced equation. Bank label: _____
Choose k so that $x = 6$ solves $4x + kx - 3x - 8 = -14$. Explain what the target determines before simplifying the full expression. Bank label: _____	In $2x + 5 - 7x - 5 + 4x + 11 = 14$, determine which additive group has total zero and which terms survive. Solve without combining unlike terms. Bank label: _____
Track the signs of every x-term in $-4x + 2x - 3x + 9 = 34$. State the net coefficient, solve exactly, and verify. Bank label: _____	Simplify and solve $-6x + 9 + 5x - 9 + 3 = -3$. Identify the constant inverse pair without discarding either variable contribution. Bank label: _____

Algebra 1

Equations with Like Terms

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.

In $3x + 2x - 3x + 5 = 13$, cancel only the additive-inverse variable pair. State the surviving coefficient, solve, and verify every original term.	Reduce the repeated x-terms in $5x - x + 2x = -24$ to one variable term, solve, and test the value in the unreduced equation.
Solve $3x + 5x - 2x + 7 = 31$. Combine the three signed coefficients before applying inverse operations, then check the original equation.	In $8x - 3x - 8x - 4 = 2$, cancel only the additive-inverse variable pair. State the surviving coefficient, solve, and verify every original term.
In $6x - x + 3x - 8 = 8$, include every implicit or fractional coefficient when collecting like terms. What is x?	Preserve every sign while reorganizing $7x + 11 + 3x - 8 - 4x + 2 = -7$. Find the variable total, constant total, and exact solution.

Algebra 1

Equations with Like Terms

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: 11 Solve $5x - 8x + 2x - 11 = -21$. Combine the three signed coefficients before applying inverse operations, then check the original equation. Your response: _____	**Incoming:** 10 In $-8x + 7x + 4x - 5 = 10$, include every implicit or fractional coefficient when collecting like terms. What is x? Your response: _____
Incoming: -7 Some constants or coefficients in $7x - 8 - 13x + 8 + 9x + 17 = 50$ cancel. Identify only the true inverse pairs, then solve the reduced equation. Your response: _____	**Incoming:** $-\frac{5}{7}$ Solve $-(\frac{23}{21})x - \frac{13}{16} + (\frac{5}{7})x + \frac{19}{24} + (\frac{4}{15})x + \frac{1}{48} = \frac{62}{385}$ by collecting variable terms and constant terms as two separate groups. Show both totals and verify. Your response: _____
Incoming: -8 Substitute $x = -\frac{9}{5}$ into $-(\frac{3}{2})x - \frac{5}{6} + (\frac{7}{4})x + d = \frac{1}{60}$, then determine the missing constant d. Check the completed equation in its original order. Your response: _____	**Incoming:** -2 The prescribed solution $x = 4$ must satisfy $3x + kx - x + 5 = 21$. Recover the missing coefficient k and verify after collecting coefficients. Your response: _____

Algebra 1

Equations with Like Terms

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 the coefficient collection in $3x - 5x + 4x + 7 = 15$. The proposed work is $12x + 7 = 15$; $x = \frac{2}{3}$. Locate the first invalid total and provide a checked correction.

For $4x + 7 - 4x - 7 + 3x + 5 + 2x - 1 = 34$, compare Route A (pair the explicit additive inverses first, then collect the survivors) with Route B (combine terms strictly from left to right). Carry out the efficient valid collection and solve.

Choose an addition order for $2x + 4 + 5x + 6 - 3x - 2 + x + 3 = -9$: A—pair coefficients and constants into convenient small sums before adding; B—combine every term strictly from left to right. Explain the arithmetic advantage, find x, and check.

Audit two proposed grouping routes for $-6x + 8 + 2x - 3 + 5x - 5 - 2x + 7 = -2$. Route A will keep each negative sign attached while grouping variable terms separately from constants; Route B will drop subtraction signs when moving terms into new visual groups. Classify them and solve with preserved signs.

Equations with Like Terms

Full Worked Solutions - excerpt

Worked example

Problem. In $x + 4x - 2x - 6 = 3$, include every implicit or fractional coefficient when collecting like terms. What is x?

Answer. 3

Explanation and check.

Treat the three x-terms as coefficient copies of one variable. Their total is 3, reducing the left side to $3x - 6$. Hence $x = 3$, and the original equality is true.

Worked example

Problem. Solve $3x + 7 + 5x - 4 - 2x + 9 = 36$ by collecting variable terms and constant terms as two separate groups. Show both totals and verify.

Answer. 4

Explanation and check.

The x-coefficients total 6, while the constants independently total 12. Thus $6x + 12 = 36$, giving $x = 4$; the interleaved original checks.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Linear Equations: Solving, Coefficients & Reasoning

Solving Linear Equations with Variables on Both Sides | A1-U02-P07

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for balance operations, exact solution, and two-side check, coefficient comparison, operation permission, and remaining relation, coefficient value or identifiability/admissibility result, first error, corrected balance operation, exact solution, and check, local forms, cross-side coefficient, exact solution, and check and net-form comparison, exact solutions, and relation.

8 PDFs and a README; 50 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

Linear Equations: Solving, Coefficients & Reasoning

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.

Simplify each side of $3x + 5 + 2x - 1 = x + 7 + 3x + 1$ independently before collecting across equality. State both local totals and solve. Bank label: _____	Track signs through the local simplification of $-4x + 6 + x + 3 = 2x - 5 - 3x + 18$, then compare the two resulting variable coefficients and verify x. Bank label: _____
Solve $-3x + 9 - 5x - 2 = 4x + 3 - x + 48$ by comparing the simplified coefficient and constant on each side. Check in the original interleaved form. Bank label: _____	Simplify each side of $6x - 8 + x + 5 = -2x - 6 + 7x + 9$ independently before collecting across equality. State both local totals and solve. Bank label: _____
Complete $5x - 4 = kx + 32$ so its prescribed solution is $x = 6$. State the coefficient and prove the target is the unique solution. Bank label: _____	Solve $-5x + 9 = -x - 15$ by applying the same variable and constant operations to both complete sides. Verify the result. Bank label: _____
For $-6x + 13 = 4x - 37$, compare the two x-coefficients first. Use their difference to solve exactly and confirm both original sides. Bank label: _____	Isolate x in $8x + 2 = -3x - 64$ without using a 'move-and-change-sign' shortcut. Name each balance-preserving operation and verify. Bank label: _____

Algebra 1

Linear Equations: Solving, Coefficients & Reasoning

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.

Solve $3x + 5 = x + 13$ by applying the same variable and constant operations to both complete sides. Verify the result.	Solve $7x + 9 = -x + 33$ by carrying out both cross-side collection choices. Explain why they preserve equality and where their intermediates differ.
Equation A is $3x + 5 = x + 13$. Equation B is created when we increase the right constant by 2: $3x + 5 = x + 15$. Predict the solution change from net constants, then confirm both values.	Substitute $x = -3$ into $-2x + 7 = kx + 25$ to determine k. Then check that the completed equation still has unequal x-coefficients.
Equation A is $-2x + 7 = 3x + 12$. Equation B is created when we change the left constant by -3: $-2x + 4 = 3x + 12$. Predict the solution change from net constants, then confirm both values.	Simplify the variable coefficients in $3x + 2x + 7 = 4x + x + 9$. Is division by their cross-side difference legitimate, and what constant relation remains? Stop before full solution-count classification.

Algebra 1

Linear Equations: Solving, Coefficients & Reasoning

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: -7 Simplify each side of $9x-11+5x+3=6x-4-2x+16$ independently before collecting across equality. State both local totals and solve. Your response: _____	**Incoming:** 2 Track signs through the local simplification of $-6x+7+4x-9=3x+12+x-62$, then compare the two resulting variable coefficients and verify x. Your response: _____
Incoming: $-\frac{3}{4}$ Solve $-5x+13-2x-6=-3x+8+4x+55$ by comparing the simplified coefficient and constant on each side. Check in the original interleaved form. Your response: _____	**Incoming:** $-\frac{9}{8}$ Track signs through the local simplification of $-11x-7+5x+10=-2x+4+8x+107$, then compare the two resulting variable coefficients and verify x. Your response: _____
Incoming: $\frac{5}{9}$ For $8x+2-4x+7=x-10+2x+28$, expose each side's net linear expression first. Only then consolidate the variable across the equality and solve. Your response: _____	**Incoming:** 0 For $x+9=4x+15$, compare the two x-coefficients first. Use their difference to solve exactly and confirm both original sides. Your response: _____

Algebra 1

Linear Equations: Solving, Coefficients & Reasoning

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 $5x + 7 = 2x + 19$, compare two first steps: L—subtract $2x$ from both sides, leaving coefficient 3 on the left; R—subtract $5x$ from both sides, leaving coefficient -3 on the right. Choose an efficient valid route and solve.

Both routes for $-3x - 5 = 4x + 9$ collect the variable on one side. Compare their resulting coefficient signs, select the cleaner path, and verify x.

Compare collecting variable terms on the left with collecting them on the right in $-6x + 11 = -2x + 31$. Give both resulting variable equations, explain why they have the same solution set despite opposite coefficient signs, and solve exactly.

Compare $5x - 3 = -x + 33$ with $10x - 6 = -2x + 66$. Explain whether the common scaling changes the solution set, and verify without resolving every step twice.

Linear Equations: Solving, Coefficients & Reasoning

Full Worked Solutions - excerpt

Worked example

Problem. Simplify each side of $3x + 5 + 2x - 1 = x + 7 + 3x + 1$ independently before collecting across equality. State both local totals and solve.

Answer. 4

Explanation and check.

Local collection gives coefficients 5 and 4 with constants 4 and 8. Their cross-side differences yield $x = 4$, verified before simplification.

Worked example

Problem. Track signs through the local simplification of $-4x + 6 + x + 3 = 2x - 5 - 3x + 18$, then compare the two resulting variable coefficients and verify x.

Answer. -2

Explanation and check.

After signed local simplification, the nonzero coefficient difference is -2. The constant difference matches 4, so $x = -2$; both original sides agree.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Writing Inequalities from Word Problems

Writing Linear Inequalities from Context | A1-U03-P01

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for inequality interpretation with boundary justification and method choice with justification, followed by inequality interpretation with boundary justification.

8 PDFs and a README; 53 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

Writing Inequalities from Word Problems

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 student remains eligible only while the absence count a has not reached 5. Write the direct comparison.

Bank label: _____

Give an equivalent comparison to $m \le 0$ that begins with 0.

Bank label: _____

A review is assigned when q, the number of missed questions, is 12 or fewer. Write the inequality.

Bank label: _____

Test $q = \frac{1}{2}$, $q = \frac{3}{4}$, and $q = 1$ against $q > \frac{3}{4}$.

Proposed value
$\frac{1}{2}$
$\frac{3}{4}$
1

Bank label: _____

A lift may carry its full 900-kilogram rating but nothing heavier. Write the constraint for load w.

Bank label: _____

Express $8 < x$ with x first.

Bank label: _____

Test $y = -0.1$, $y = 0$, and $y = 0.1$ in $y > 0$.

Proposed value
-0.1
0
0.1

Bank label: _____

If k is an integer and $k \ge -3$, identify the boundary's status and the least possible k.

Bank label: _____

Algebra 1

Writing Inequalities from Word Problems

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.

Under $x \geq 4$ with real x, determine whether the boundary is a member and identify the least value.

Which is the stronger upper restriction, $x \leq 3$ or $x \leq 7$? Give a value showing why the weaker one does not imply the stronger.

For the signed-change condition $c \leq 0$, decide whether -7, 0, and 3 qualify.

Proposed value
-7
0
3

Are the permitted sets for $x \geq 2$ and $x \leq 6$ nested? Support the answer with one witness for each failed implication.

For a nonnegative integer count n subject to $n < 0$, decide whether a greatest or least feasible value exists.

Determine whether $t = 4.5$ and $t = 5$ satisfy $0.4t + 1 \geq 3$.

Proposed value
4.5
5

Algebra 1

Writing Inequalities from Word Problems

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: $T > -3$.

A specification says, 'A reading of -5 is no greater than the signed change c.' Express the permitted c-values with c on the left and explain equality.

Your response: _____

Incoming: $c \geq -5$, with -5 included.

A signed change c is required to be at most -4. State the inequality and do not replace the negative bound with a magnitude.

Your response: _____

Incoming: $t \geq 12$.

A temperature T exceeds -3 degrees Celsius. State the inequality, keeping the negative boundary.

Your response: _____

Incoming: $-6 \geq c$.

A reservation permits a maximum of 9 guests. Write a direct bound for g, the guest count.

Your response: _____

Incoming: $L > 6.2$.

Rewrite $0 \geq h$ with h as the subject on the left.

Your response: _____

Incoming: $s \geq 86$.

Rewrite $x < 7$ with 7 on the left while preserving exactly the same permitted x-values.

Your response: _____

Algebra 1

Writing Inequalities from Word Problems

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.

Choose the most reliable method, briefly justify the choice, and then complete the original task. Original task: For $p \le 250$, determine the status of $p = 0$, $p = 250$, and $p = 251$.

Proposed value
0
250
251

Label	Proposed method
A	Substitute each proposed value into the original comparison and evaluate both sides.
B	Compare only the absolute values and ignore the comparison symbol.
C	Decide only from how close each value is to the boundary.

For real x, compare $x > 2$ and $x \ge 2.5$. Which condition is stronger, and what value separates them?

Writing Inequalities from Word Problems

Full Worked Solutions - excerpt

Worked example

Problem. A student remains eligible only while the absence count a has not reached 5. Write the direct comparison.

Answer. $a < 5$.

Explanation and check.

Counts 0 through 4 have not reached five; equality at five fails.

Worked example

Problem. Give an equivalent comparison to $m \leq 0$ that begins with 0.

Answer. $0 \geq m$.

Explanation and check.

Zero being greater than or equal to m says exactly that m is at most zero.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Addition and Subtraction Inequalities

Addition and Subtraction Inequalities | A1-U03-P02

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for solution inequality with order-preservation justification and solution inequality with order-preservation justification; justified method selection.

8 PDFs and a README; 48 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

Addition and Subtraction Inequalities

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.

Recover k so that $k < x + 2$ has solution $x > 6$. Bank label: _____	Choose a so $2.4 \geq x + a$ has the upper boundary -0.6. Bank label: _____
Isolate x in $-\frac{7}{4} > x + \frac{1}{2}$ and put x first afterward. Bank label: _____	Solve $x - \frac{11}{12} < \frac{1}{6}$ exactly. Bank label: _____
Solve $-11.2 \leq x + 3.8$. Bank label: _____	Determine the exact solution of $x - \frac{5}{6} < -\frac{1}{3}$. Bank label: _____
Solve $6.4 > x + 1.9$ with an x-first answer. Bank label: _____	Solve $x + \frac{1}{6} < \frac{5}{12}$ exactly. Bank label: _____

Algebra 1

Addition and Subtraction 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. Give the whole requested response, including any reasoning the question asks for.

Which of $0.8 > x - 0.6$ and $1.5 > x + 0.4$ permits more values?	A student reports $x < 6$ for $x + 2 \leq 8$. Does the endpoint test support that strictness?
A solution to $x - \frac{7}{5} < \frac{3}{5}$ is written $x \leq 2$. Test the boundary to judge the equality bar.	The proposed solution of $x + 7 < 3$ is $x < -3$. Test the claimed boundary and determine the actual one.
Find the signed offset a that makes $x + a \geq -2$ solve to $x \geq 5$.	Is there a value of b for which $3 < x\text{-}b$ has the real solution $x \geq 7$?

Algebra 1

Addition and Subtraction 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: $x > \frac{7}{6}$. An inequality says that x plus negative 4 is greater than 6. Undo the signed offset. Your response: _____	**Incoming:** $x > 10$. Isolate x in $-\frac{5}{3} < x - \frac{2}{3}$. Your response: _____
Incoming: a = −7. Solve $\frac{1}{3} < x - \frac{5}{6}$ and report x first. Your response: _____	**Incoming:** $x < -\frac{2}{9}$. Solve $x - \frac{7}{6} \leq -\frac{1}{2}$ with exact arithmetic. Your response: _____
Incoming: The shift gives $12 \geq x$, so $x \leq 12$. State the solution of $x + 0 \leq 4$ and explain the zero offset. Your response: _____	**Incoming:** $x > 1$. Solve $0 \geq x - 0.04$ and preserve the inclusive symbol. Your response: _____

Algebra 1

Addition and Subtraction 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.

A student solves $x - 2.5 \geq -1$ as $x \geq -3.5$ by subtracting 2.5 again. Diagnose and correct.

A tenth-scaled graph proposes $x \leq -3$ for $x + 2.25 \leq -0.75$. Audit its endpoint and sides.

A proposed solution to $x - 5 \leq -2$ is $x \geq 3$. Evaluate $2, 3$, and 4 to locate the direction error.

A student correctly chooses $a + 3$ translation for $x - 3 > -8$ but reverses the symbol and tests only $x = -6$. Explain why that test is misleading and repair the ray.

Addition and Subtraction Inequalities

Full Worked Solutions - excerpt

Worked example

Problem. Recover k so that $k < x + 2$ has solution $x > 6$.

Answer. k = 8.

Explanation and check.

Subtracting 2 gives $k - 2 < x$. The lower boundary $k - 2$ must be 6, so $k = 8$.

Worked example

Problem. Choose a so $2.4 \geq x + a$ has the upper boundary -0.6.

Answer. a = 3.

Explanation and check.

Solving gives $x \leq 2.4$-a. Requiring 2.4-$a = -0.6$ yields $a = 3$.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Multiplication and Division Inequalities

Multiplication and Division Inequalities | A1-U03-P03

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for allowable scale with identifiability explanation, allowable scale with identifiability explanation; justified method selection, first error and repaired reasoning, reversed comparison with justification, reversed comparison with justification; justified method selection and set relationship with decisive witness.

8 PDFs and a README; 47 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

Multiplication and Division Inequalities

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.

Choose k so $kx > -9$ is equivalent to $x > -6$. Bank label: _____	Determine r so x divided by r at most $\frac{3}{4}$ has boundary $\frac{9}{8}$. Bank label: _____
Determine a so that $ax \le 18$ produces the target $x \ge -6$. Bank label: _____	Solve $(-\frac{5}{12})x \le -\frac{35}{18}$ and simplify the exact boundary. Bank label: _____
Determine the x-first solution of $-\frac{5}{2} \ge x$ divided by -3. Bank label: _____	Solve $-7 < -x$ without losing the strict endpoint. Bank label: _____
Solve $-0.06x \ge 0.9$ exactly. Bank label: _____	Find the solution set of $(\frac{13}{6})x \ge 0$. Bank label: _____

Algebra 1

Multiplication and Division 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. Give the whole requested response, including any reasoning the question asks for.

Starting from $m < n$, scale by -2 and then by -3. Track each reversal and give the final comparison.	Find p so $px > \frac{5}{6}$ yields the target $x < -\frac{10}{3}$.
Verify $x \leq 6$ as the solution of $18 \geq 3x$.	Solve $ax < 6$ for every possible sign of a, including $a = 0$.
Isolate x in $8x \leq 8$.	What changes when $-3x \leq 12$ is made strict?

Algebra 1

Multiplication and Division 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 $x \leq -12$. Solve $-2.7 \geq 0.9x$ with x on the left. Your response: _____	**Incoming:** The solution is $x \leq -3$. Determine the solution of $\frac{x}{7} \leq -2$. Your response: _____
Incoming: The answer is $x > 6$. Isolate x in $(-\frac{3}{4})x \geq 9$. Your response: _____	**Incoming:** The answer is $x > 0$. Find the x-first ray equivalent to $4.2 < -0.6x$. Your response: _____
Incoming: The ray is $x > -6$. Solve x divided by $\frac{7}{3}$ at most $-\frac{2}{7}$. Your response: _____	**Incoming:** The solution is $x > \frac{11}{9}$. Find all x satisfying $-0.25x \leq 2$. Your response: _____

Algebra 1

Multiplication and Division 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.

A claimed solution of $-0.25x < 3$ is $x < -0.75$. Diagnose it using the true equality input and simple witnesses.

A student claims multiplying $1 < 3$ by -2 gives $-2 < -6$. Test the claim and repair it.

Use the test values $x = -8, x = -9$, and $x = 0$. A proposed answer for $(-\frac{3}{4})x > 6$ is $x > -8$. Use the listed values to audit its direction.

A student starts with $-2x \leq 14$, divides by -2 and reverses to $x \geq -7$, then reverses again because the boundary is negative and writes $x \leq -7$. The work reverses once for a negative divisor and again because the boundary is negative. Locate the first invalid line after the correct step.

Multiplication and Division Inequalities

Full Worked Solutions - excerpt

Worked example

Problem. Choose k so $kx > -9$ is equivalent to $x > -6$.

Answer. The scale is k = $\frac{3}{2}$.

Explanation and check.

The direction is preserved, so $k > 0$. Solving $-\frac{9}{k} = -6$ yields $k = \frac{3}{2}$.

Worked example

Problem. Determine r so x divided by r at most $\frac{3}{4}$ has boundary $\frac{9}{8}$.

Answer. The divisor is r = $\frac{3}{2}$.

Explanation and check.

The unchanged orientation requires $r > 0$; $(\frac{3}{4})r = \frac{9}{8}$ gives $r = \frac{3}{2}$.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Two-Step Inequalities

Two-Step Inequalities | A1-U03-P04

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for accepted or repaired set with boundary and witnesses, construction satisfying all constraints with verification, first error and corrected chain, solution after order-safe denominator clearing, solution after value-preserving expansion and solution set with connected inverse steps.

8 PDFs and a README; 50 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

Two-Step 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.

Solve $-2\frac{n}{3} + \frac{1}{4} \geq \frac{11}{12}$ for integer n. Bank label: _____	Find the x-values for $-6x - 5 > 13$. Bank label: _____
Solve x divided by negative 5 minus 1 greater than 2. Bank label: _____	Find the solution of $\frac{5-2x}{3} - \frac{x+1}{4} > \frac{1}{6}$. Bank label: _____
Clear denominators in $3\frac{x}{4} - \frac{x}{6} \geq 7$ and solve. Bank label: _____	Solve x divided by negative $\frac{5}{4}$ plus 3 at least -1. Bank label: _____
Expand $-2(3x - 4)$ and solve the inequality. Use the inequality - $2(3x - 4) \geq 20$. Bank label: _____	Expand both groups in $5(2x - 1) - 3(x + 4) \geq -3$ and solve. Bank label: _____

Algebra 1

Two-Step 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.

Construct an inequality with coefficient 3 and a nonzero negative offset whose solution is $x < 4$.	What is the solution set of $5(2\text{-}x) + 5x > 10$?
Solve $\frac{x-1}{2} + \frac{x+2}{3} < 5$.	Construct an inequality using the group $x - 1$ and outer factor 2 that solves to $x > 5$.
Verify $x < -5$ for $(-\frac{3}{5})x + 2 > 5$.	For integer n, verify $n \geq 3$ as the solution of $\frac{2n-1}{3} > \frac{5}{4}$.

Algebra 1

Two-Step 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 exact ray is $x < -\frac{7}{5}$.

Solve $-0.125x + 1 < 0$.

Your response: _____

Incoming: The answer is $x > 8$.

Solve $(-\frac{5}{8})x + \frac{7}{12} \geq -\frac{1}{6}$ using exact fractions.

Your response: _____

Incoming: Every real x is a solution.

Solve $-2(3x - 5) + x > 17$.

Your response: _____

Incoming: The solution is $x > \frac{81}{16}$.

Find the solution of $7 - 2(2x + 1) \geq 17$.

Your response: _____

Incoming: The solution is $x \leq 4$.

Solve $-\frac{x}{4} + \frac{x}{6} - \frac{x}{3} \leq -\frac{5}{8}$.

Your response: _____

Incoming: The solution is $x \leq -12$.

Clear the denominator and solve $\frac{x}{2} + 3 < 7$.

Your response: _____

Algebra 1

Two-Step 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.

Compare two order-safe routes for $-\frac{x}{3}+\frac{1}{2} \geq \frac{5}{6}$.

Proposed route A: multiply every term by positive 6. Proposed route B: isolate $-\frac{x}{3}$, then multiply by -3.

For integer n, compare both complete routes for $(-\frac{4}{3})n+\frac{1}{2} > \frac{5}{6}$.

Proposed route A: clear by positive 6, solve, then restrict. Proposed route B: isolate the fraction, use a signed reciprocal, then restrict.

Audit $x \leq \frac{5}{2}$ for $\frac{x}{3}+\frac{1}{2} \leq \frac{5}{6}$.

Compare clearing denominators first with isolating $\frac{x}{2}$ first.

Use $\frac{x}{2}+\frac{1}{3} < \frac{7}{3}$. Proposed route A: multiply every term by 6. Proposed route B: subtract $\frac{1}{3}$, then multiply by 2.

Two-Step Inequalities

Full Worked Solutions - excerpt

Worked example

Problem. Solve $-2\frac{n}{3} + \frac{1}{4} \geq \frac{11}{12}$ for integer n.

Answer. The integer set is $n \leq -1$.

Explanation and check.

Multiplying by 12 yields $-8n + 3 \geq 11$, so $-8n \geq 8$ and $n \leq -1$.

Worked example

Problem. Find the x-values for $-6x - 5 > 13$.

Answer. The solution is $x < -3$.

Explanation and check.

Adding 5 produces $-6x > 18$; division by -6 reverses $>$ and yields -3.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Multi-Step Inequalities

Solving Multi-Step Linear Inequalities | A1-U03-P05

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for classified solution set with net-coefficient reasoning and classified solution set with net-coefficient reasoning; justified method selection.

8 PDFs and a README; 49 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

Multi-Step 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.

Solve $1.5(x + 2) < 0.5(x + 8)$. Bank label: _____	Solve the strict decimal identity. The inequality is $1.2(5x - 1) > 6x - 1.2$. Bank label: _____
Solve $2x + 7 > 4x - 1$. Bank label: _____	Solve $0.05(20x + 4) > 0.2x + 1.8$. Bank label: _____
Solve $2(x + 3) - 3(x - 1) > 4(1\text{-}x)$. Bank label: _____	Solve $-1.2x + \frac{3}{5} \le 0.4x - \frac{13}{5}$. Bank label: _____
Solve $-2x + 3 < -5x + 18$. Bank label: _____	Find all x satisfying $5 - 2(x + 1) > x - 6$. Bank label: _____

Algebra 1

Multi-Step 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.

Construct a strict both-side inequality true for every x. Use these original construction conditions: equal variable coefficients; strict true constants.	Construct a strict both-side inequality with empty solution set. Use these original construction conditions: identical expressions; strict symbol.
Construct a fraction inequality whose integer solutions are $n \geq 2$. Use these original construction conditions: fraction coefficients; real boundary $\frac{3}{2}$; strict.	For integer n, classify the inequality. The inequality is $3n + 5 \leq 3(n + 2)$.
Determine all a-cases. The inequality is $(a - 1)x + a > 2x + 5$.	Construct a time inequality giving $0 \leq t \leq 6$. Use these original construction conditions: t nonnegative; closed upper bound; variable both sides. The target set is $0 \leq t \leq 6$ hours.

Algebra 1

Multi-Step 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 $x > 3$.

Find all x satisfying $6x + 4 \le 2(x + 1) + x$.

Your response: _____

Incoming: The closed ray is $x \le -\frac{2}{3}$.

Solve $-2(x + 4) \ge -5(x - 1)$.

Your response: _____

Incoming: The answer is $x \ge -\frac{3}{2}$.

Solve $4x + 1 > -2x + 19$.

Your response: _____

Incoming: In interval notation, the solution set is (2, infinity).

Convert the mixed number and solve.

The inequality is $(-1\frac{1}{2})(2x - 4) > (\frac{1}{2})(x + 3)$. Here - $1\frac{1}{2}$ is the mixed number negative one and one half.

Your response: _____

Incoming: The strict answer is $x > -1$.

Solve $(-\frac{2}{3})(x - 3) \le \frac{x}{3} + 4$.

Your response: _____

Incoming: Exactly $x < 0$ satisfies it.

Solve $4(2x - 1) \ge 2(4x + 1)$.

Your response: _____

Algebra 1

Multi-Step 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.

For all a, compare the two reduced routes including $a = 3$.

The inequality is $ax + 1 < 3x + 7$. Supplied route A: $(a - 3)x < 6$. Supplied route B: $(3 - a)x > -6$.

For integer n, compare the routes through the domain step.

The inequality is $5n + 1 > 2n + 10$. Supplied route A: $3n > 9$. Supplied route B: $-9 > -3n$.

Explain why the routes point to the same closed ray.

The inequality is $-x + 4 \le 2x + 4$. Supplied route A: $-3x \le 0$. Supplied route B: $0 \le 3x$.

Relate the positive- and negative-net routes.

The inequality is $7x + 1 \le 3x + 13$. Supplied route A: $4x \le 12$. Supplied route B: $-12 \le -4x$.

Multi-Step Inequalities

Full Worked Solutions - excerpt

Worked example

Problem. Solve $0.07x + 0.12 > 0.02x + 0.32$.

Answer. The result is $x > 4$.

Explanation and check.
Subtract $0.02x$ and 0.12: $0.05x > 0.20$.

Worked example

Problem. Construct a strict both-side inequality true for every x.

Use these original construction conditions: equal variable coefficients; strict true constants.

Answer. Use $5x - 2 < 5x + 7$.

Explanation and check.
Cancellation leaves $-2 < 7$.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Compound Inequalities

Solving Compound Inequalities | A1-U03-P06

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for compound solution set with connector and endpoint reasoning.

8 PDFs and a README; 48 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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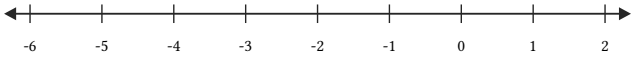
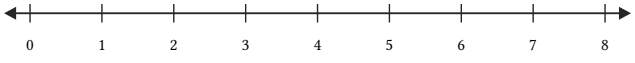
Algebra 1

Compound Inequalities

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.

Combine the conditions $(\frac{2}{3})x - 1 \geq -3$ AND $(\frac{1}{2})x + 2 < 5$. Find the exact common interval. Bank label: _____	Solve $x \leq 7$ AND $x < 4$. Bank label: _____
A course pass requires a grade of at least 70, unless an approved alternate assessment has been passed. Let A denote alternate passed; let g denote course grade. Model the two passing routes. Bank label: _____	Show the intersection of $x \leq -2$ and $x > -2$.  Bank label: _____
Combine the conditions $(-4 < x \leq 7)$ AND $(-4 \leq x < 6)$. Compute the exact intersection, paying attention at -4. Bank label: _____	Which scheduled hours 0, 2, 4, 6, and 8 satisfy $t < 2$ OR $t > 6$? Bank label: _____
Translate every part of $2 < x - 4 \leq 10$. Bank label: _____	Combine the conditions $(-2x \geq -8)$ OR $(-3x < -12)$. Solve and combine the rays.  Bank label: _____

Algebra 1

Compound 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. Give the whole requested response, including any reasoning the question asks for.

The target solution set is (−infinity,-2] union (5,infinity). Both displayed coefficients of x must be negative. Construct the target OR set so each component requires negative division.	Check -5 in the condition $x < -3$ OR $x > 6$.
Determine whether 0 belongs to $x < -4$ OR $x > 4$.	An integer code is accepted if it is nonpositive or at least 8. Let n denote integer code. State the connector, inequalities, and domain.
Test $x = 0$ and $x = 3$ after solving each part of $5 - 2x \geq 1$ OR $3x + 4 > 1$.	Work with $-8 < 3x + 1 \leq 7$. Solve the mixed-endpoint chain.

Algebra 1

Compound 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 interval is $(3, 5]$.

The allowed values are natural numbers 1 through 8. Apply the condition $5n < 10$ OR $2n \geq 12$. Solve the OR condition and list permitted natural numbers in the window.

Your response: _____

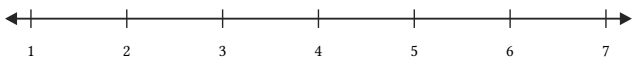
Incoming: The set is $\{1, 6, 7, 8\}$.

Solve $-3 < x + 2 < 5$.

Your response: _____

Incoming: The set is $x < -3$ OR $x \geq 4$.

Combine the conditions $(7 < 2x + 1)$ AND $(5x - 4 \leq 21)$. Solve the oppositely written bounds and graph the result.



Your response: _____

Incoming: The overlap is $[-6, 2)$.

Combine the conditions $((a + 2)x \leq -a - 2)$ OR $(x > 4)$. Given $a > -2$, solve the OR condition.

Your response: _____

Incoming: The set is $\{1, 2, 3, 5, 6, 7\}$.

Rewrite $7 > 2x - 1 \geq -5$ in increasing order and solve.

Your response: _____

Incoming: The interval is $-1 \leq x < 3$.

Solve $-2 < -x \leq 5$ and write the bounds in increasing order.

Your response: _____

Algebra 1

Compound 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.

For $x > -5$ OR $x \geq 2$, *a* student keeps only $x \geq 2$, claiming that the stricter bound must be used. Explain why 'stricter' is the wrong union rule.

Admission is free for children under 5 or for members who are at least 65. Let a denote age in years; let m denote membership status. Translate the two eligibility routes without treating age alone as sufficient in the second route. Explicitly select AND or OR (including any nested connector), and justify why that logic matches the stated conditions.

Let A be the condition $x < 0$ and B the condition $x > 0$. Edit B to $x \geq 0$ and compare before and after.

For integer n, let A be the condition $n < 3.5$ and B the condition $n \leq 3$. Compare AND and OR over the stated integer domain.

Compound Inequalities

Full Worked Solutions - excerpt

Worked example

Problem. Combine the conditions $((\frac{2}{3})x - 1 \geq -3)$ AND $((\frac{1}{2})x + 2 < 5)$. Find the exact common interval.

Answer. The solution is $x \geq -3$ AND $x < 6$, or $[-3, 6)$.

Explanation and check.

Solving the fraction inequalities gives the two stated bounds.

Worked example

Problem. Solve $x \leq 7$ AND $x < 4$.

Answer. The result is $x < 4$.

Explanation and check.

The strict bound at 4 is the more restrictive upper condition.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Relations and Mapping Diagrams

Relations and Mapping Diagrams | A1-U04-P01

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for chosen method, complete mapping, and a reason rejecting the information-losing method and exact finite relation with representation evidence.

8 PDFs and a README; 75 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.

Published by Tusils LLC.

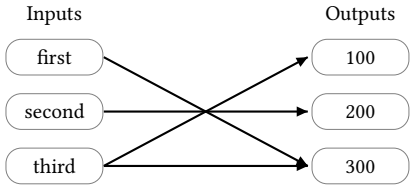
Algebra 1

Relations and Mapping Diagrams

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

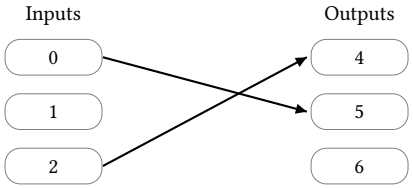
Answer each question and record the matching bank letter. Give exact values. Give the whole requested response, including any reasoning the question asks for.

Use arrow incidence rather than list position to write the relation.



Bank label: _____

Convert the diagram and name labels that create no pair.



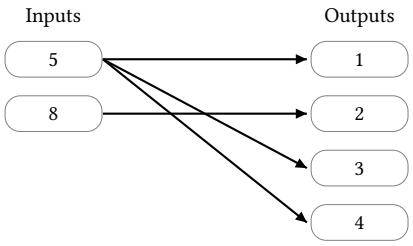
Bank label: _____

List the relation without collapsing rows that share an output.

Input	Output
−3	2
1	2
5	2
7	0

Bank label: _____

Record every destination reached from input 5 and the remaining arrow.



Bank label: _____

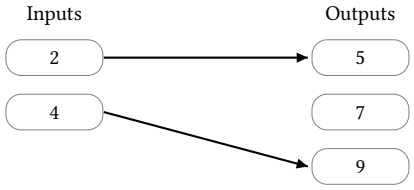
Algebra 1

Relations and Mapping Diagrams

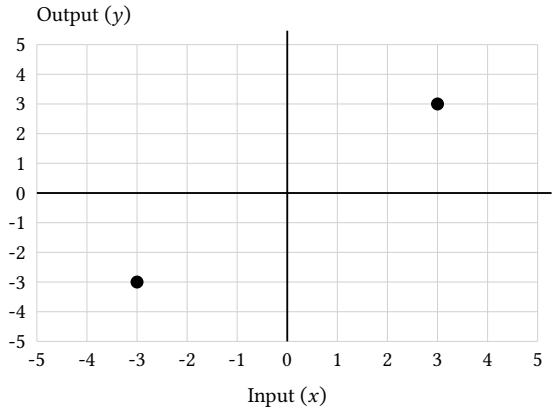
Name: _____ **Date:** _____ **Class:** _____

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.

Read the relation and handle the unused output label correctly.



The graph window shows every integer from −5 to 5 on both axes. Which points belong to the relation?



Convert the unsorted rows without *re*-pairing them.

Input	Output
5	9
1	2
3	6

The complete diagram contains labels but no arrows. What relation is represented?

Algebra 1

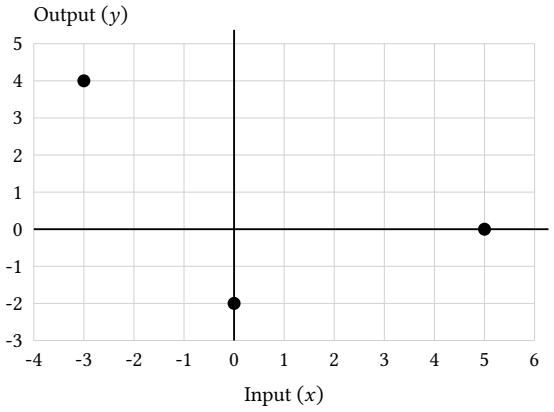
Relations and Mapping Diagrams

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: $\{(7, 3), (2, 8), (7, 5)\}$

An exact plot marks the three listed coordinates. Write its relation.



Your response: _____

Incoming: $\{(-3, 4), (0, -2), (5, 0)\}$

Preserve every association when converting the table.

Input	Output
2	5
2	8
4	9

Your response: _____

Incoming: $\{(1, 4), (3, 7)\}$

Produce the distinct relation from all shown rows.

Input	Output
7	3
2	8
7	5
2	8

Your response: _____

Incoming: $\{(1, 1), (2, 2), (3, 1)\}$

Here null means no association. Form the relation set from the exhaustive rows.

Input	Output
0	-1
0	null
-1	0
-1	0

Your response: _____

Algebra 1

Relations and Mapping Diagrams

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

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

A draft has arrows $1 \to a$ and $2 \to b$ for $R = \{(1, a), (1, b), (2, b)\}$. Choose a completion method: A, compare each required pair with the arrows already drawn; or B, draw every possible input-output arrow. Apply your choice and explain why the other method would change R.

The complete pair log is $(0, 4), (0, 4), (2, 6)$. To construct its relation diagram, choose A, remove repeated identical pairs before drawing arrows, or B, replace the two rows with input 0 by one row whose output is 8. Draw the resulting mapping and justify the choice.

For $R = \{(0, 0), (2, 0)\}$, use input labels $\{0, 1, 2\}$ and output labels $\{0, 3\}$. Choose A, omit labels equal to zero before drawing, or B, list every prescribed label and draw arrows only for the supplied pairs. Construct the diagram and explain how your method distinguishes zero from an unused label.

Represent $R = \{(A, 9), (B, 7), (B, 9)\}$ with outputs on the left and inputs on the right. Choose A, make every arrow point left-to-right, or B, make every arrow go from the first coordinate to the second coordinate. Construct the diagram and justify the direction.

Relations and Mapping Diagrams

Full Worked Solutions - excerpt

Worked example

Problem. Do matching label sets establish equality?

Answer. No; for instance $(\text{red}, 1)$ occurs only in the first set.

Explanation and check.

Both coordinate inventories match, but every association is crossed.

Worked example

Problem. Does the repeated identical row make a different relation?

Answer. No; both represent $\{(2, 7), (4, 9)\}$.

Explanation and check.

An exact duplicate adds no new ordered pair to a set.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Is It a Function

Is It a Function | A1-U04-P02

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for complete function or impossibility proof, corrected judgment with decisive evidence, definition-based justification, function verdict with decisive evidence, two function verdicts with decisive evidence and valid repair or impossibility with evidence.

8 PDFs and a README; 125 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

Is It a Function

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

Answer each question and record a bank letter whose complete statement correctly answers that question. A letter may be used more than once or not at all. Give exact values and all reasoning requested by the question; a letter alone is not the whole requested response.

The declared domain is empty and the complete arrow list is empty. Does the function condition hold?

Bank label: _____

Algebra 1

Is It a Function

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.

Can a function satisfy a pair that appears on both the required and forbidden lists?

After consolidating exact duplicate rows, decide whether a genuine conflict remains.

Input	Output
3	4
3	4
6	8
9	1
6	8
3	−4

Algebra 1

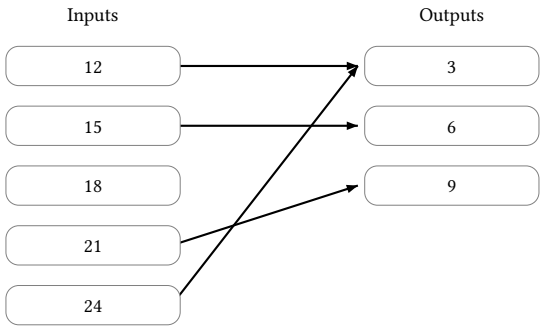
Is It a Function

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

Begin at START. Answer the card completely, then match the entire answer and reasoning to another card's Incoming statement. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: No. For example, $x = 2$ gives the included points $(2, 2)$ and $(2, -2)$. Reasoning: Excluding the origin does not remove the two intersections at every positive x.

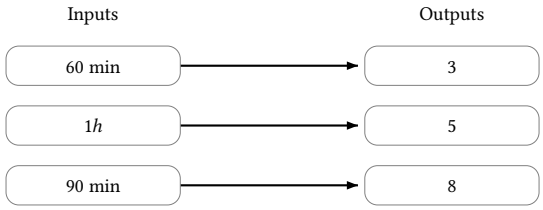
Scan all five declared inputs instead of judging only the drawn arrows.



Your response: _____

Incoming: Not a function on the stated domain; input 18 is unassigned. Reasoning: The four valid arrows do not compensate for the missing output at 18.

Interpret the declared domain as exact durations before testing output uniqueness.



Your response: _____

Algebra 1

Is It a Function

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.

Diagnose the error in the table verdict and give the corrected conclusion.

Input	Output
1	6
3	6
8	2

Audit whether row multiplicity creates distinct output values.

Input	Output
4	9
4	9
7	1

Is It a Function

Full Worked Solutions - excerpt

Worked example

Problem. The declared domain is empty and the complete arrow list is empty. Does the function condition hold?

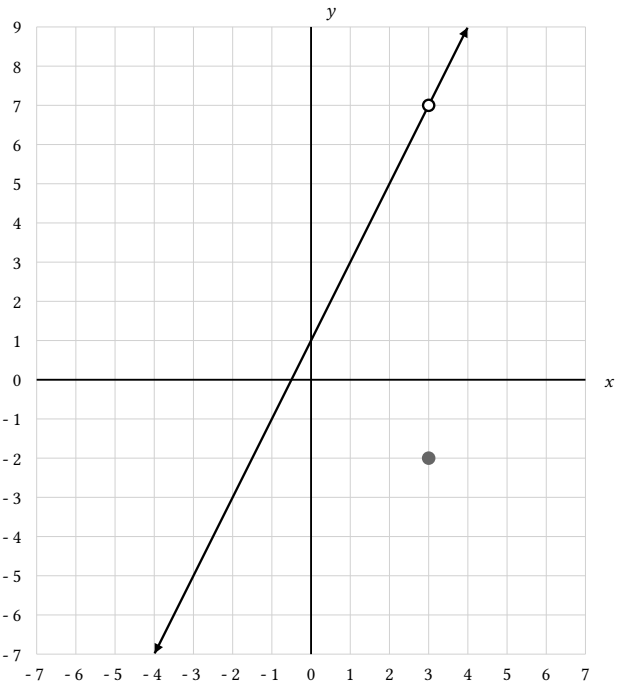
Answer. Yes. There is no declared input that lacks an output or has two outputs.

Explanation and check.

The one-output requirement is satisfied vacuously on the empty domain.

Worked example

Problem. The line has a hole and a replacement point at the same x. Apply the vertical line test to what is included.



Answer. Function. At $x = 3$ only $(3, -2)$ is included; all other x-values lie once on the line.

Explanation and check.

The open point $(3, 7)$ is not an intersection, so the closed replacement supplies one output.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Interpreting Function Notation

Function Notation and Interpretation | A1-U04-P03

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for notation statement or semantic interpretation.

8 PDFs and a README; 52 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 Function 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.

The argument is an identifier, not a measurement. Interpret $M(204) = 57$. $M(i)$ is mass in grams of package with item code i. Bank label: _____	Name the given quantity and requested quantity in the ticket instruction. $C(n)$ is cost for n tickets. The instruction is "Find $C(5)$." Bank label: _____
The number 3 appears among known outputs. Does that make $p(3)$ defined? The declared domain is $\{2, 4, 6\}$. Bank label: _____	What does $P(0) = 4$ reveal about this parking charge? $P(n)$ is parking charge in dollars for n completed hours. Bank label: _____
Check the endpoint, a non-whole value, and an over-limit value. The declared domain is whole numbers from 0 through 12 inclusive. Consider the given statements $P(12), P(12.5), P(13)$. Bank label: _____	What is supplied and what is sought in 'determine $R(a + 1)$'? Bank label: _____
Read $R(12) = 0.35$ without interpreting 12 as a count of red pieces $R(k)$ is the ratio of red pieces to all pieces in sample k. Bank label: _____	Identify the role of $b + 3$ without solving the equation. The instruction is "Solve $T(x) = b + 3$ for the possible x-values." Bank label: _____

Algebra 1

Interpreting Function 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.

Use east-positive input and upward-positive output conventions $e(x)$ is elevation change in meters at x kilometers east of camp. Two kilometers west of camp, elevation is 11 meters lower than at camp.	Resolve the date offset and measurement in $R(-3) = 0.8$. $R(d)$ is rainfall in millimeters on the day d days relative to July 10.
Interpret $I(6) = 24$ using both measurement units. $I(d)$ is light intensity in lumens at depth d meters.	Treat the coordinate label as one argument and encode the reading. $Z(i)$ is pressure in kilopascals for sensor position i, where an ordered pair labels a position. Sensor position $(2, -1)$ reads 98 kilopascals.
Describe what happens after f receives a in $3(f(a) - 2)$.	Separate the roles in the two stages before any calculation. The two instructions are: First report $S(0)$. Then identify every t with $S(t) = S(0)$.

Algebra 1

Interpreting Function 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: Exchanging 50 US dollars yields $7,250$ yen.

Use the row with input 5 to write one equation for w.

Input	Output
-3	9
0	2
5	-6

Your response: _____

Incoming: $w(5) = -6$.

Treat each coordinate pair as one input object and classify both expressions.

The declared domain is $\{(0,0),(1,2)\}$. Consider the given statements $V((1,2)), V(1)$.

Your response: _____

Incoming: $Q(3)$ and $Q(3.0)$ are undefined; $Q(-3)$ is defined

State the exchange direction encoded by $Y(50) = 7250$.

$Y(d)$ is yen received when d US dollars are exchanged.

Your response: _____

Incoming: $(6, -11)$.

Encode the instantaneous rate observation.

$r(t)$ is speed in meters per second at time t seconds. At 4 seconds, the speed is 7.5 meters per second.

Your response: _____

Incoming: Divide n by 2 first and use $\frac{n}{2}$ as q's input.

Convert the date to an offset and write the function statement.

$R(d)$ is rainfall in millimeters d days relative to September 10. On September 13, rainfall is 4.6 millimeters.

Your response: _____

Incoming: $(-2, 5)$.

What graph point is represented by $m(3) = 3$?

Your response: _____

Algebra 1

Interpreting Function 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.

Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Convert the graph-membership sentence to function notation.

Use the function N. The given statement is The point $(c, -d)$ is on the graph of N..

Complete the task, then compare the direct formula approach with an equivalent check. Explain why both support the same conclusion. State the generic ordered-pair form conveyed by $h(n) = 2n + 1$.

Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Write the table association small → blue using function C.

Input	Output
small	blue

Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Ignore the record ID and use the semantic headers to encode the row for Q.

Q-value	input	record ID
−8	3	$R17$

Interpreting Function Notation

Full Worked Solutions - excerpt

Worked example

Problem. The argument is an identifier, not a measurement. Interpret $M(204) = 57$.

$M(i)$ is mass in grams of package with item code i.

Answer. The package with item code 204 has a mass of 57 grams.

Explanation and check.
Code 204 selects the item; 57 grams is its measured output.

Worked example

Problem. Name the given quantity and requested quantity in the ticket instruction.

$C(n)$ is cost for n tickets. The instruction is "Find $C(5)$."

Answer. The count 5 tickets is given; the cost output is requested.

Explanation and check.
C takes ticket count as input and returns cost.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Evaluating Functions from Representations

Evaluating Functions | A1-U04-P04

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for exact function value or justified information status.

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

Evaluating Functions from Representations

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 rule $B(x) = |2x - 3| + 1$. Its domain is all real numbers. Evaluate $B(-1)$ in the correct operation order.

Bank label: _____

Interpret exact numerical equality to find $L(0.5)$.

Input	Output
$\frac{1}{2}$	6
2	9

Bank label: _____

Find $p(4)$ even though an output repeats.

Input	Output
1	5
4	5
7	2

Bank label: _____

Use the rule $h(x) = \frac{x^2}{2}$. Its domain is all real numbers. Evaluate $h(3) - 2h(1)$. Compute the exact combination of rule outputs.

Bank label: _____

Use the rule $W(x) = |x| + 2$. Its domain is all real numbers. Compute $W(2 - 7)$.

Bank label: _____

Ignore the record number and evaluate $N(3)$.

record	input	output
101	-2	4
205	3	8
310	7	1

Bank label: _____

Algebra 1

Evaluating Functions from Representations

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 the rule $W(x) = x - 2$. Its domain is all real numbers. Evaluate $\frac{W(5)}{W(1)+W(3)}$. Evaluate the denominator combination before dividing.

Use the rule $g(x) = (x + 1)^2 - 4$. Its domain is all real numbers. Evaluate $\frac{[g(-3)+g(1)]}{[g(0)-g(-1)]}$. Evaluate all four represented outputs before simplifying the ratio.

$V(t)$ is volume in liters t hours after opening. The allowed domain is $0 \le t < 2$. The requested input is 120 minutes. Convert the time and use endpoint inclusion to determine the volume value.

Consolidate the duplicate record and state $K(5)$.

Input	Output
5	8
1	3
5	8
−2	4

Use the rule $o(x) = \frac{1}{x+1}$. Its domain is all real x except -1. Evaluate $o(-\frac{3}{3})$. Compute the quotient argument and check the excluded input.

The declared domain is whole numbers. Is more table information needed to determine $r(1.5)$?

Algebra 1

Evaluating Functions from Representations

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: $P(-3) = 97$ kilopascals three days before inspection.

$z(t)$ is vertical position in meters above a platform t seconds after launch. Use $z(t) = 6t - 20$. The allowed domain is $0 \le t \le 5$. The requested input is 2 seconds. Evaluate and interpret a negative position output.

Your response: _____

Incoming: $z(2) = -8$ meters, meaning 8 meters below the platform.

$L(t)$ is sea-level change in centimeters relative to a fixed reference level, t hours after 6*a.m.* Use $L(t) = 0.5t - 5$. The allowed domain is $0 \le t \le 12$. The requested input is 2*p.m.* Resolve the clock reference, evaluate, and interpret the level reference.

Your response: _____

Incoming: $E(1.5) = 2.9$ kilowatt-hours after 90 minutes.

$P(d)$ is pressure in kilopascals d days relative to an inspection. Use $P(d) = 100 + d$. The allowed domain is -5 ≤ d ≤ 5. The requested input is 3 days before inspection. Translate the relative date to an input and evaluate pressure.

Your response: _____

Incoming: $h(2) = -5$.

$D(t)$ is distance in miles after t hours. Use $D(t) = 55t$. The allowed domain is $t \ge 0$. Use the model to find the traveled distance after 2.5 hours.

Your response: _____

Incoming: $A(2.5) = 6.25$ square meters.

$P(n)$ is price in dollars for n tickets. Use $P(n) = 7n$. The allowed domain is whole numbers $n \ge 0$. The requested input is 5 tickets. Evaluate the ticket price for five tickets.

Your response: _____

Incoming: $Y(32) = 4640$ yen.

Use the rule $m(x) = 0.5(3x - 2)^2$. Its domain is all real numbers. Evaluate $m(2)$ with the inner linear value first.

Your response: _____

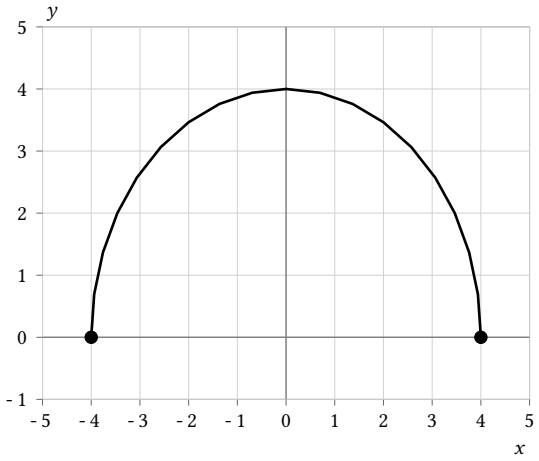
Algebra 1

Evaluating Functions from Representations

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.

Choose an efficient method, explain why it fits the given representation, and then complete the task exactly. Read $Q(0)$ from the specified upper half-circle.



Complete the task, then compare the direct table approach with an equivalent check. Explain why both support the same conclusion. Columns are displayed output first. Find $G(4)$.

output	input
8	1
3	4
−2	6

Evaluating Functions from Representations

Full Worked Solutions - excerpt

Worked example

Problem. Use the rule $B(x) = |2x - 3| + 1$. Its domain is all real numbers. Evaluate $B(-1)$ in the correct operation order.

Answer. $B(-1) = 6$.

Explanation and check.

$2(-1) - 3 = -5$

so

$|-5| + 1 = 6$

Worked example

Problem. Interpret exact numerical equality to find $L(0.5)$.

Input	Output
$\frac{1}{2}$	6
2	9

Answer. $L(0.5) = 6$.

Explanation and check.

Decimal 0.5 equals the listed input $\frac{1}{2}$.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Finding Inputs from Function Outputs

Inverse Functions and Reverse Lookup | A1-U04-P05

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for all admissible inputs with justification.

8 PDFs and a README; 80 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

Finding Inputs from Function Outputs

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. Bank letters may be reused or left unused. If several entries give a complete correct answer in the question's context, any of those letters is acceptable. Keep required units and conditions.

Is the extra range fact sufficient for a complete reverse lookup?

rows: $(0, 8), (2, 3), (5, 8)$; table scope: partial; additional fact: every unlisted input has output below 0; target output: 8

Input	Output
0	8
2	3
5	8

Bank label: _____

Select all candidates allowed by the even-integer domain.

The supplied candidate inputs are $-4, 1, 6$. The declared domain is even integers. The target output is 12.

Bank label: _____

Use the graph-domain endpoints to filter the two contacts.

The supplied candidate inputs are $(-1, 2)$. The graph's domain is $-1 < x \leq 4$. The target output is 3.

Bank label: _____

Recover every symbolic input that maps to m.

rows: $(a, m), (b, n), (c, m), (d, p)$; table scope: exhaustive; target output: m

Input	Output
a	m
b	n
c	m
d	p

Bank label: _____

Algebra 1

Finding Inputs from Function Outputs

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.

Retain only positive inputs.

The supplied candidate inputs are $(0, 5)$. The declared domain is $x > 0$. The target output is 1.

Simplify candidates, then impose number type and endpoints.

The supplied candidate inputs are $-\sqrt{4}, \frac{1}{3}, \sqrt{2}, 3$. The declared domain is rational x with $-2 < x \leq 3$. The target output is 9.

Which candidates can represent the item-count input?

The supplied candidate inputs are $-2, 0, 6$. The declared domain is whole-number item counts. The target output is $\$30$.

Filter the candidates through the closed interval.

The supplied candidate inputs are $(-3, 4)$. The declared domain is $0 \leq x \leq 6$. The target output is 5.

Which candidate times fall within operating hours?

The supplied candidate inputs are $8, 14, 19$. The declared domain is hours 9 through 17 inclusive. The target output is target occupancy.

Apply all three domain conditions to the candidate set.

The supplied candidate inputs are $-6, -2, 3, 8$. The declared domain is integers x with $-3 \leq x < 8$ and $x \neq 3$. The target output is 4.

Algebra 1

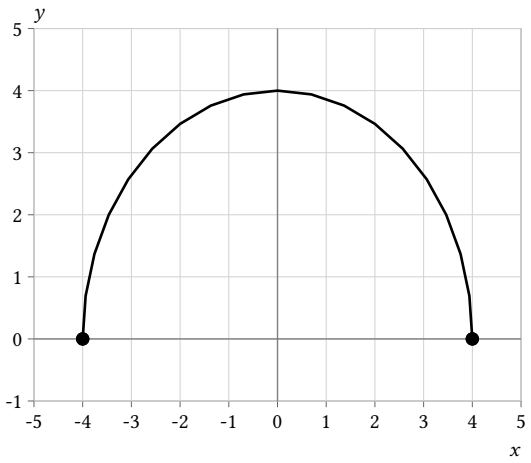
Finding Inputs from Function Outputs

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: Every x in $[-1, 4]$.

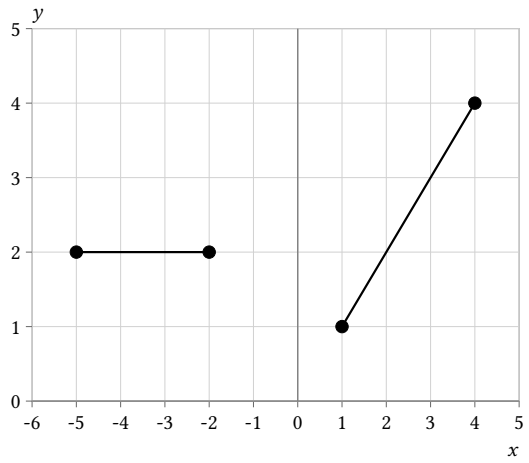
Recover the inputs at the semicircle's zero level.



Your response: _____

Incoming: x = −4 and $x = 4$.

Find all inputs at height 2 across both pieces.



Your response: _____

Algebra 1

Finding Inputs from Function Outputs

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.

Does the output bound make the observed reverse lookup complete?

rows: $(1, 7), (4, 2), (8, 7)$; table scope: partial; additional fact: all outputs are between 0 and 10; target output: 7

Input	Output
1	7
4	2
8	7

Diagnose the direction error and recover the input.

The rule is $f(x) = 2x + 1$. The target output is 9. The supplied student work is: $f(9) = 19$, so the answer is 19.

Finding Inputs from Function Outputs

Full Worked Solutions - excerpt

Worked example

Problem. Is the extra range fact sufficient for a complete reverse lookup?

rows: $(0, 8), (2, 3), (5, 8)$; table scope: partial; additional fact: every unlisted input has output below 0 ; target output: 8

Input	Output
0	8
2	3
5	8

Answer. Yes. The full set is $\{0, 5\}$.

Explanation and check.

Both listed matches count, and negative unlisted outputs cannot equal 8.

Worked example

Problem. Select all candidates allowed by the even-integer domain.

The supplied candidate inputs are $-4, 1, 6$. The declared domain is even integers. The target output is 12.

Answer. $\{-4, 6\}$.

Explanation and check.

Both -4 and 6 are even; 1 is not.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Domain and Range

Domain and Range | A1-U04-P06

96 problems · Four activity formats

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: _____

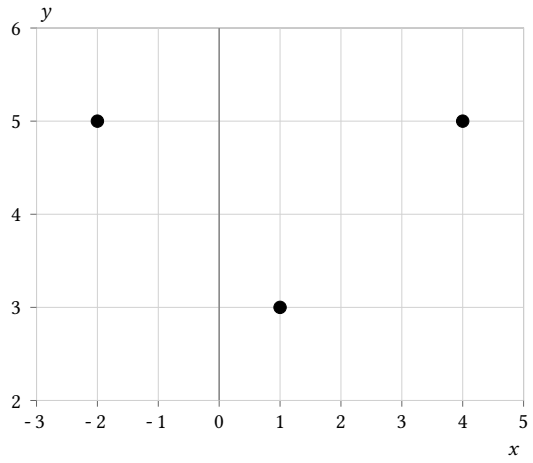
Algebra 1

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

Average Rate of Change in Context

Average Rate of Change in Context | A1-U05-P01

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for a rate, comparison, interpretation, or justified conclusion with units.

8 PDFs and a README; 47 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

Average Rate of Change in Context

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 print shop quotes a variable cost rate of 4 cents per page. What changes, and by how much, when the page count rises by one? Bank label: _____	Pump A fills at 3 liters per minute; pump B fills at 150 liters per hour. Which pump has the greater fill rate? Bank label: _____
A connected graph passes through $(0, 1)$, $(2, 7)$, and $(5, 16)$ with straight segments. Is the output rate constant from $x = 0$ to $x = 5$? Bank label: _____	Battery charge is 93% at hour 2 and 69% at hour 8. Find its average rate in percentage points per hour. Bank label: _____
One graph segment runs from $(2, 9)$ to $(8, 9)$; another runs from $(-3, 1)$ to $(1, 3)$. Compare average rates. Bank label: _____	A concentration changes steadily at $-\frac{7}{4}(\frac{mg}{L})$ per hour for 12 hours. Find ΔC. Bank label: _____
The number of people inside a hall is changing at +25 people per minute. Interpret the plus sign and the rate unit. Bank label: _____	Printer R produces 5 pages per minute. Printer S produces 280 pages per hour. Which output rate is greater? Bank label: _____

Algebra 1

Average Rate of Change in Context

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 reservoir's water depth changes at -3 centimeters per day. What does this signed rate say about the depth?	Temperature changes constantly at -3 °C per hour for 6 hours. What is the total temperature change?
A trail profile has a rate of change of $\frac{3}{4}$ meter of elevation per horizontal meter. Explain this rate without using the word slope.	A cart moves at a constant 8 miles per hour for $\frac{3}{2}$ hours. How much does its traveled distance change?
Snow depth is increasing at 2 inches per hour. Translate the rate into an input-output statement.	A robot's signed position changes at $12\frac{m}{s}$ for $\frac{5}{4}$ seconds. Compute Δx.

Algebra 1

Average Rate of Change in Context

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: Downloaded data increases by 45 megabytes. A balance table uses thousands of dollars: 16 at month 2 and 37 at month 14. Give the average rate in dollars per month. Your response: _____	**Incoming:** The average rate is $\$1,750$ per month. A lift raises its platform at 18 meters per minute for $\frac{5}{6}$ minute. What elevation change occurs? Your response: _____
Incoming: The average rate is 4 megabytes per hour. A connection downloads at a constant 20 MB/s for $\frac{9}{4}$ seconds. Find the change in downloaded data. Your response: _____	**Incoming:** Distance from home increases by 7 kilometers. A chamber contains 3 L at time 0 and 9 L after 8 seconds. What is the average volume rate? Your response: _____
Incoming: The average rate is $\frac{1}{2}$ inch per hour. Snow accumulates at $\frac{1}{4}$ inch per hour for 16 hours. How much does depth increase? Your response: _____	**Incoming:** Pressure changes by -21 kilopascals. A bin holds 48 kg of grain on day 2 and 44 kg on day 6. State the average rate of mass change. Your response: _____

Algebra 1

Average Rate of Change in Context

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

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

A student says, 'Reading 12 pages in 3 minutes means the rate is 12 pages.' Diagnose and correct the statement.

A calculation uses output values 2 and 8 at input values 1 and 5, then reports $\frac{2}{3}$ input units per output unit. Find the error.

A hiker is 2 km from camp at both noon and $2p.m.$. A student concludes the hiker's distance never changed. Audit the conclusion.

A value rises from 14 to 38 between hour 3 and hour 9. A student computes $\frac{38-14}{9}$. Diagnose the denominator.

Average Rate of Change in Context

Full Worked Solutions - excerpt

Worked example

Problem. A print shop quotes a variable cost rate of 4 cents per page. What changes, and by how much, when the page count rises by one?

Answer. The cost increases by 4 cents when the order gains one page.

Explanation and check.

The output is cost and the input is pages, so one page adds four cents.

Worked example

Problem. Pump A fills at 3 liters per minute; pump B fills at 150 liters per hour. Which pump has the greater fill rate?

Answer. Pump A; $3 L/\text{min} = 180 \frac{L}{h}$, which is greater than $150 \frac{L}{h}$.

Explanation and check.

Convert the denominator unit: 3 liters each minute corresponds to

$$3 \times 60 = 180$$

liters each hour.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Slope from Two Points

Slope from Two Points | A1-U05-P02

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for an exact slope, coordinate, construction, comparison, or justified conclusion.

8 PDFs and a README; 46 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

Slope from Two Points

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 two coordinates $(-4, -3)$ and $(2, 3)$ to calculate m. Bank label: _____	Evaluate the difference ratio for $(0, -2)$ and $(6, 1)$. Bank label: _____
A report labels the slope through $(-4, 6), (9, 6)$ undefined. Diagnose the confusion. Bank label: _____	Using the points in the listed order, find the slope from $(5, 2)$ to $(1, 10)$. Bank label: _____
Show with exact differences that reversing $(4, -1), (-2, 8)$ does not change the slope. Bank label: _____	Compute the slope joining $(7, -3)$ to $(9, 3)$. Bank label: _____
A student uses $\frac{2-11}{15-3}$, then swaps the points. What ratio must the student use to keep the slope unchanged? Bank label: _____	Find the slope of the distinct points $(-6, 8), (9, 8)$. Bank label: _____

Algebra 1

Slope from Two Points

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 slope for the pair $(3, -1), (3, 6)$.	What is the slope from the point pair $(-5, 6), (-2, 0)$?
Find the exact slope between $(-1, 4)$ and $(3, 0)$.	Two points are $(-3, 1)$ and $(1, 3)$. Compute their slope.
A second point has $y = 8$ but unknown x, while the first is $(-3, 2)$. Does this identify one slope?	Construct a vertical point pair with $x = -2$ and y-coordinates of opposite signs.

Algebra 1

Slope from Two Points

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: x = −19.

A point $(x, 2)$ has slope $\frac{5}{8}$ with $(1, -3)$. Determine x.

Your response: _____

Incoming: x = 9.

Identify all equal slope outcomes among pairs A, B, and C, where A and B have repeated x-coordinates.

A: $(-2, 1), (-2, 9)$; B: $(6, -5), (6, 4)$; C: $(0, 0), (1, 8)$

Your response: _____

Incoming: One pair is $(0, -5)$ and $(2, 0)$.

Find x in $(x, 11)$ when the slope to $(-1, -1)$ is $-\frac{2}{3}$.

Your response: _____

Incoming: For $(-4, -7)$ and $(5, -5)$, the slope is $\frac{2}{9}$.

Compute the slope from $(-9, 3)$ to $(-5, 14)$.

Your response: _____

Incoming: y = 8.

Which signed slope is greater: A through $(0, 0), (5, -4)$ or B through $(2, 7), (9, 1)$?

Your response: _____

Incoming: x = 2.

If $(5, -1)$ and $(9, y)$ have slope $-\frac{3}{4}$, find the missing output coordinate.

Your response: _____

Algebra 1

Slope from Two Points

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 points $(1, 2)$ and $(5, 10)$, a student writes $\frac{10-2}{1-5} = -2$. Diagnose and repair the calculation.

A solution for $(-2, 1), (4, 10)$ computes run over rise and reports $\frac{2}{3}$. Correct it.

Pairs A and B start at $(0, 0)$ and end at $(4, 4)$ and $(4, -4)$. Compare their signed slopes and magnitudes.

A student calls the slope through $(3, -5), (3, 8)$ zero because the x-values match. What is the correct conclusion?

Slope from Two Points

Full Worked Solutions - excerpt

Worked example

Problem. Use the two coordinates $(-4,-3)$ and $(2,3)$ to calculate m.

Answer. For $(-4,-3)$ and $(2,3)$, the slope is 1.

Explanation and check.

Rise and run are both 6, hence $m=\frac{6}{6}=1$.

Worked example

Problem. Evaluate the difference ratio for $(0,-2)$ and $(6,1)$.

Answer. For $(0,-2)$ and $(6,1)$, the slope is $\frac{1}{2}$.

Explanation and check.

The ratio of changes is $\frac{1-(-2)}{6-0}=\frac{3}{6}=\frac{1}{2}$.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Slope from Tables and Graphs

Slope from Tables and Graphs | A1-U05-P03

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for an exact slope, missing datum, comparison, or justified linearity conclusion.

8 PDFs and a README; 87 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

Slope from Tables and 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.

The graphs show the same square angle but use different horizontal units. Graph A: 4 squares right, 2 squares up; each horizontal square is 1x-units and each vertical square is 1y-units. Graph B: 4 squares right, 2 squares up; each horizontal square is 2x-units and each vertical square is 1y-units. Compare their signed coordinate slopes.

Bank label: _____

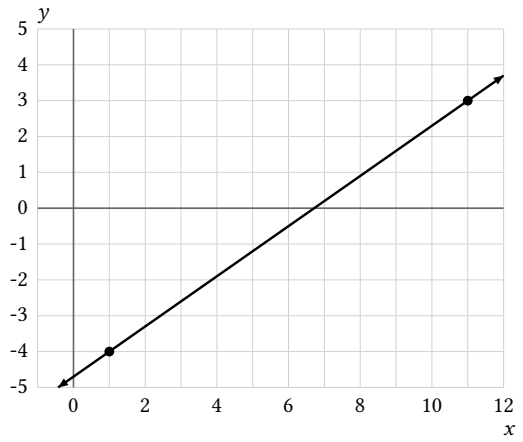
An interior output must share the common rate. The table $x = -3, y = 2$; $x = 1, y =?$; $x = 5, y = 10$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
−3	2
1	_____
5	10

Bank label: _____

An exact line graph marks the points $x = 1, y = -4$; $x = 11, y = 3$. Determine its slope.



Bank label: _____

An input cell must be recovered from its output. The table $x = 2, y = 0$; $x =?$, $y = 8$; $x = 8, y = 12$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
2	0
_____	8
8	12

Bank label: _____

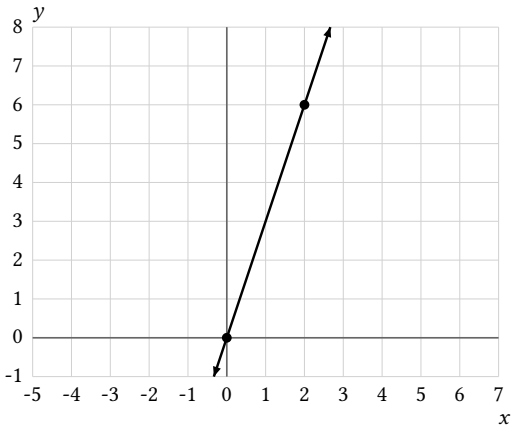
Algebra 1

Slope from Tables and 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.

An exact line graph marks the points $x = 0, y = 0$; $x = 2, y = 6$. Determine its slope.

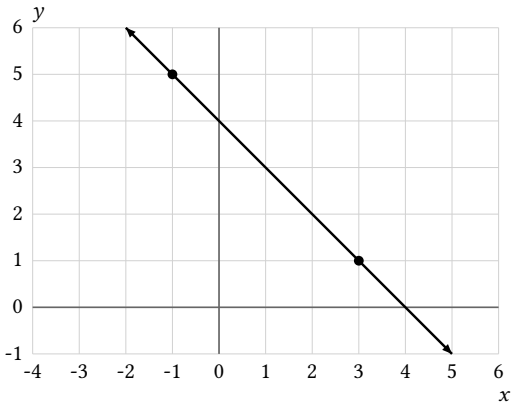


A middle output cell is blank. The table $x = 0, y = 2$; $x = 2, y =$?; $x = 4, y = 10$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
0	2
2	_____
4	10

On a coordinate graph, the line passes through $x = -1, y = 5$; $x = 3, y = 1$. Read the rise and run from left to right and find m.



Does the table $x = 0, y = 1$; $x = 1, y = 3$; $x = 2, y = 5$; $x = 3, y = 7$ have a constant slope? Support the decision with interval rates.

Input x	Output y
0	1
1	3
2	5
3	7

Algebra 1

Slope from Tables and 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 missing value in x = $-\frac{5}{2}, y = -1$; $x =$?, $y = 2$; $x = \frac{7}{2}, y = 5$ is $x = \frac{1}{2}$.

The output pattern uses noninteger values. The table $x = 0, y = \frac{2}{3}$; $x = 3, y =$?; $x = 9, y = \frac{20}{3}$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
0	$\frac{2}{3}$
3	_____
9	$\frac{20}{3}$

Your response: _____

Incoming: The missing value in x = 0, $y = \frac{2}{3}$; $x = 3, y =$?; $x = 9, y = \frac{20}{3}$ is $y = \frac{8}{3}$.

A visually flat segment competes with a steep scaled segment. Graph A: 8 squares right, 2 squares up; each horizontal square is $3x$-units and each vertical square is $1y$-units. Graph *B*: 2 squares right, 8 squares up; each horizontal square is $1x$-units and each vertical square is $\frac{1}{4}y$-units. Compare their signed coordinate slopes.

Your response: _____

Incoming: On x = 0 to $x = 6$, the requested slope is 1, but one global slope is not justified; adjacent average rates are $3, 0, -3$.

A fractional input must be reconstructed exactly. The table $x = -\frac{5}{2}, y = -1$; $x =$?, $y = 2$; $x = \frac{7}{2}, y = 5$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
$-\frac{5}{2}$	-1
_____	2
$\frac{7}{2}$	5

Your response: _____

Incoming: The slope is $-\frac{3}{5}$; the coordinate rise is 6 and the coordinate run is -10.

This table is declared linear: $x = 2, y = -8$; $x = 8, y = -4$; $x = 17, y = 2$. Determine its common slope.

The table is declared linear.

Input x	Output y
2	-8
8	-4
17	2

Your response: _____

Algebra 1

Slope from Tables and Graphs

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

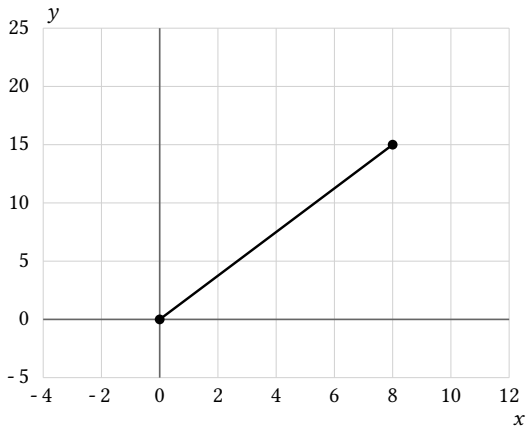
Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

A student reads the table $x = 0, y = 2$; $x = 3, y = 8$ and calls the slope 6. Diagnose the answer.

slope is 6

Input x	Output y
0	2
3	8

A graph moves 4 squares right and 3 up; x-squares represent 2 units and y-squares 5 units. A student reports $\frac{3}{4}$. Audit the scale use.



Slope from Tables and Graphs

Full Worked Solutions - excerpt

Worked example

Problem. The graphs show the same square angle but use different horizontal units. Graph A: 4 squares right, 2 squares up; each horizontal square is $1x$-units and each vertical square is $1y$-units. Graph B: 4 squares right, 2 squares up; each horizontal square is $2x$-units and each vertical square is $1y$-units. Compare their signed coordinate slopes.

Answer. Graph A has slope $\frac{1}{2}$ and graph B has slope $\frac{1}{4}$; A's signed slope is greater than B's.

Explanation and check.

The graphs show the same square angle but use different horizontal units. After applying both axis scales, compare $\frac{1}{2}$ and $\frac{1}{4}$.

Worked example

Problem. An interior output must share the common rate. The table $x = -3, y = 2$; $x = 1, y = ?$; $x = 5, y = 10$ is declared linear. Determine the missing entry, or explain why no valid unique entry follows.

The table is declared linear.

Input x	Output y
-3	2
1	_____
5	10

Answer. The missing value in x = $-3, y = 2$; $x = 1, y = ?$; $x = 5, y = 10$ is $y = 6$.

Explanation and check.

An interior output must share the common rate. Known complete rows give slope 1, and propagating that rate yields 6.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Positive, Negative, Zero, and Undefined Slope

Positive, Negative, Zero, and Undefined Slope | A1-U05-P04

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for positive, negative, zero, or undefined with a decisive reason.

8 PDFs and a README; 92 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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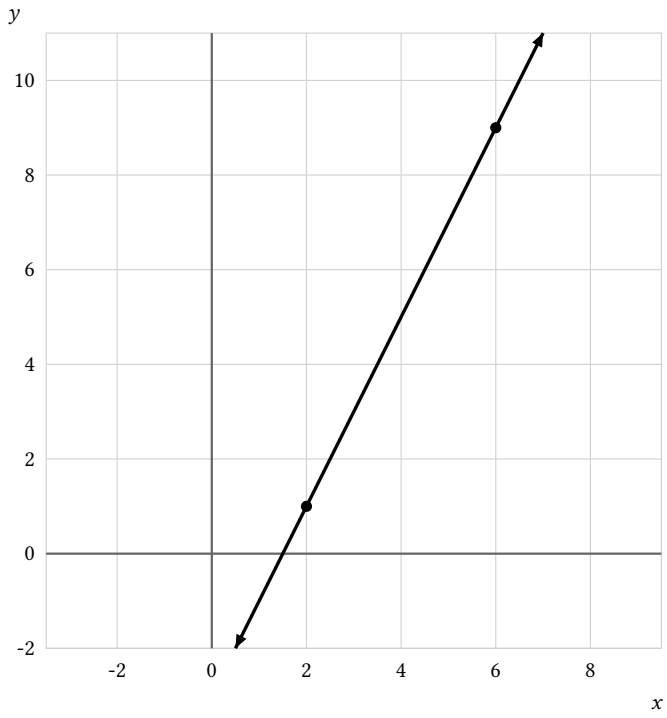
Algebra 1

Positive, Negative, Zero, and Undefined Slope

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 line graph passes through $(2, 1), (6, 9)$. As x increases, classify its slope.



Bank label: _____

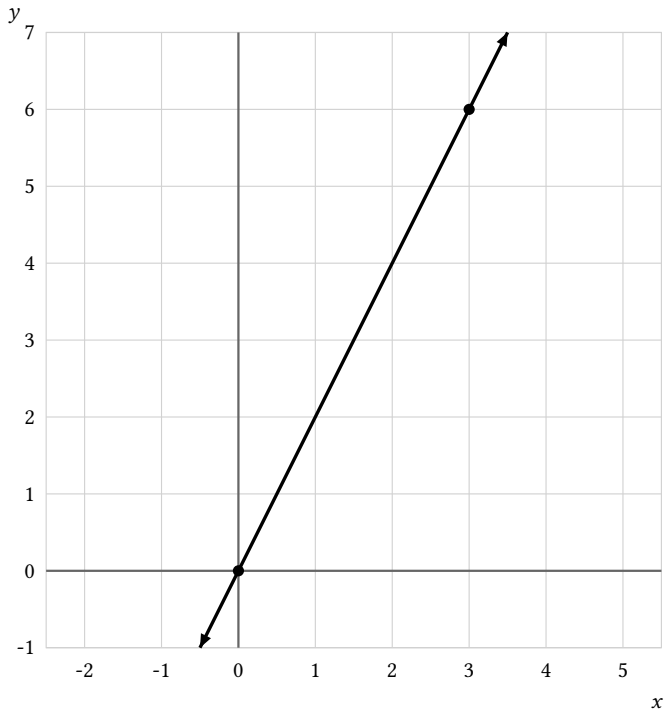
Algebra 1

Positive, Negative, Zero, and Undefined Slope

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.

An exact line graph passes through $(0, 0), (3, 6)$. As x increases, classify its slope.



Algebra 1

Positive, Negative, Zero, and Undefined Slope

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: s = 0 and r is nonzero Classify the slopes of the full lines $x + y = 0$, x-$y = 0$, $x = 0$, and $y = 0$, in that order. Your response: _____	**Incoming:** Negative, positive, undefined, zero The graph of $y = f(x)$ is a straight line with negative slope. Put $f(-2)$, $f(0)$, and $f(5)$ in order from greatest to least. Your response: _____
Incoming: The left endpoint, $x = -2$ A distinct-point slope is written $\frac{r}{s}$, where r is the vertical change and s is the horizontal change. State exactly the conditions on r and s for an undefined slope. Your response: _____	**Incoming:** Check whether both changes are zero; then the repeated point does not determine a slope One full line has positive slope and another full line has zero slope. How many intersection points must they have? Your response: _____

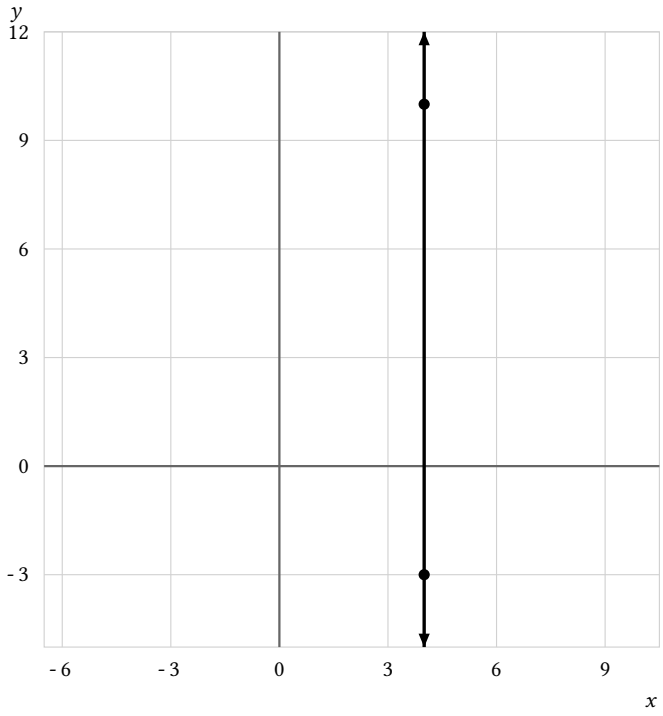
Algebra 1

Positive, Negative, Zero, and Undefined Slope

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.

Choose and justify a method before solving (compare coordinate changes, inspect orientation, or calculate rise over run). Then complete the task: A graph through $(4, -3), (4, 10)$ is labeled zero slope because x does not change. Correct the label.

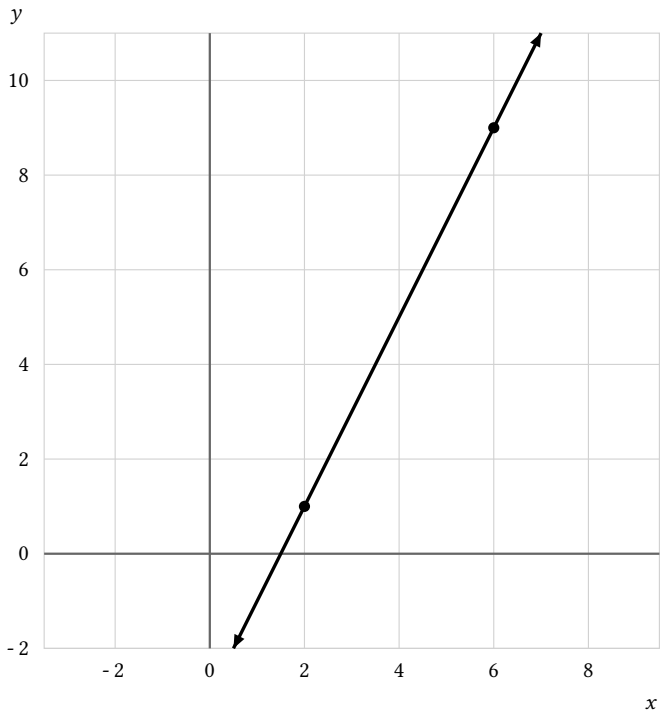


Positive, Negative, Zero, and Undefined Slope

Full Worked Solutions - excerpt

Worked example

Problem. An exact line graph passes through $(2, 1), (6, 9)$. As x increases, classify its slope.



Answer. The line through $(2, 1), (6, 9)$ has positive slope.

Explanation and check.

The signed changes are $\Delta x = 4$ and $\Delta y = 8$; their matching signs make the slope positive.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Interpreting Slope-Intercept Form

Interpreting Slope-Intercept Form | A1-U05-P05

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for identified or interpreted slope and vertical intercept with justification.

8 PDFs and a README; 55 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.

Published by Tusils LLC.

Algebra 1

Interpreting Slope-Intercept Form

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.

Give the exact y-intercept point for $y = (\frac{3}{5})x + \frac{7}{2}$. Bank label: _____	An account model is $B = 25m - 40$ dollars after m months. Interpret the rate and the signed zero-month value. Bank label: _____
Locate the vertical intercept of $y = -(\frac{4}{7})x - \frac{5}{3}$ using exact coordinates. Bank label: _____	A walker has $d = t$, with d in meters and t in seconds. Explain the implicit m and b. Bank label: _____
Write the y-axis crossing of $y = 0.8x + 2.5$ as (x, y). Bank label: _____	For $y = 5 - 2x$, an annotation says $m = 5$ and $b = -2$. Audit the term roles. Bank label: _____
What intercept point follows from $b = -3.4$ in $y = -1.2x - 3.4$? Bank label: _____	A graph for $y = 7x$ marks the origin and $(1, 7)$, but annotates $m = 7$ and vertical intercept $(0, 7)$. Which part is inconsistent? Bank label: _____

Algebra 1

Interpreting Slope-Intercept Form

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.

Explain the roles of 4 and 3 in the displayed rule $y = 4x + 3$.	A student says the slope of $y = 3x + 8$ is 8 because it is the last number. Diagnose the reading.
From $y = 2x + 5$, give the vertical-intercept point as an ordered pair.	A savings plan is $S = 18w + 45$, with S in dollars and w in weeks. Interpret m and b.
Where does the line $y = 4x - 7$ meet the y-axis? Answer with coordinates.	Tank volume follows $V = -8t + 120$, where t is minutes and V is liters. State what both parameters mean.

Algebra 1

Interpreting Slope-Intercept Form

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: For y = $-3x, m = -3$ and $b = 0$. A rule is written simply as $y = 8$. Identify its slope and intercept value. Your response: _____	**Incoming:** For y = $8, m = 0$ and $b = 8$. Express the parameters of the horizontal rule $y = -6$ as m and b. Your response: _____
Incoming: For y = $5x, m = 5$ and $b = 0$. For $y = -3x$, give both m and b rather than omitting the zero parameter. Your response: _____	**Incoming:** For y = $-7x + 3, m = -7$ and $b = 3$. Read the parameter pair (m, b) from $y = 4x - 5$. Your response: _____
Incoming: For y = $x, m = 1$ and $b = 0$. Account for the sign in $y = -x + 2$ and report m and b. Your response: _____	**Incoming:** For y = $-4x + 7, m = -4$ and $b = 7$. Name m and b for the already isolated equation $y = 6x - 2$. Your response: _____

Algebra 1

Interpreting Slope-Intercept Form

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 exact graph for $y = -x$ marks $(0, 0), (3, -3)$ and is annotated $m = -1, b = 0$. Verify the labels.

A table header for $y = -0.6x - 1.4$ lists rate 0.6 and start 1.4. Audit all signs and translate the start to a point.

A horizontal graph through $(0, 5), (4, 5)$ is labeled $m = 5$ and $b = 5$ for $y = 5$. Audit the labels.

A student labels $x = 7$ with $m = 0$ and $b = 7$ as though it were $y = 0x + 7$. Explain why this is not a valid parameter reading for slope-intercept form.

Interpreting Slope-Intercept Form

Full Worked Solutions - excerpt

Worked example

Problem. Give the exact y-intercept point for $y = (\frac{3}{5})x + \frac{7}{2}$.

Answer. The vertical-intercept point for $y = (\frac{3}{5})x + \frac{7}{2}$ is $(0, \frac{7}{2})$.

Explanation and check.

At the y-axis $x = 0$. Substituting removes the x-term and leaves $y = \frac{7}{2}$, hence $(0, \frac{7}{2})$.

Worked example

Problem. An account model is $B = 25m - 40$ dollars after m months. Interpret the rate and the signed zero-month value.

Answer. In B = $25m - 40$, when one month passes, balance increases by $\$25$; the balance is -$\$40$ at month 0.

Explanation and check.

The x-variable coefficient describes output change per one input unit: balance increases by $\$25$. The constant describes the zero-input output: the balance is -$\$40$ at month 0.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Graphing Slope-Intercept Form

Graphing Slope-Intercept Form | A1-U05-P06

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for an exact graph construction or verification with stated domain.

8 PDFs and a README; 118 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.

Published by Tusils LLC.

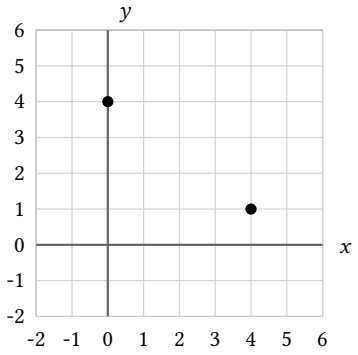
Algebra 1

Graphing Slope-Intercept Form

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

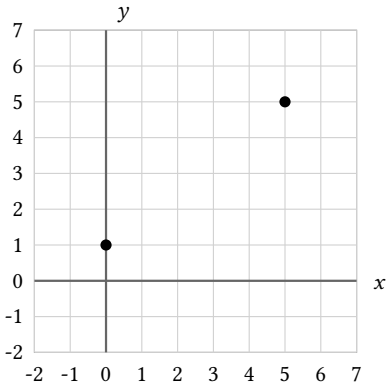
Answer each question and record the matching bank letter. Give exact values. A value without its unit is not a complete answer.

Graph $y = -(\frac{3}{4})x + 4$ by the intercept-and-step method. Specify the starting point and one correctly directed second point.



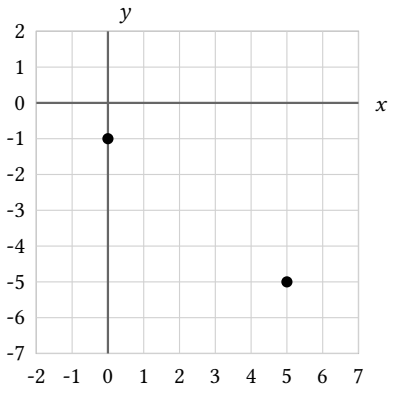
Bank label: _____

Use slope-intercept construction for $y = (\frac{4}{5})x + 1$. Which two exact points can anchor the graph?



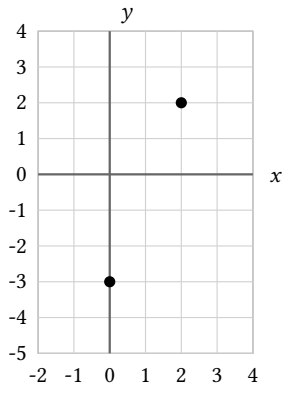
Bank label: _____

Graph $y = -(\frac{4}{5})x - 1$ by the intercept-and-step method. Specify the starting point and one correctly directed second point.



Bank label: _____

Use slope-intercept construction for $y = (\frac{5}{2})x - 3$. Which two exact points can anchor the graph?



Bank label: _____

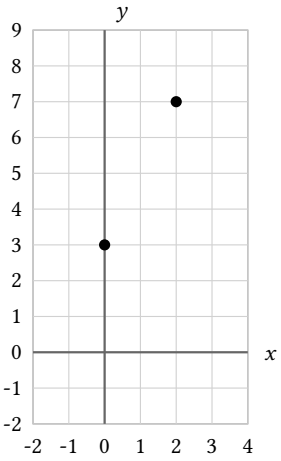
Algebra 1

Graphing Slope-Intercept Form

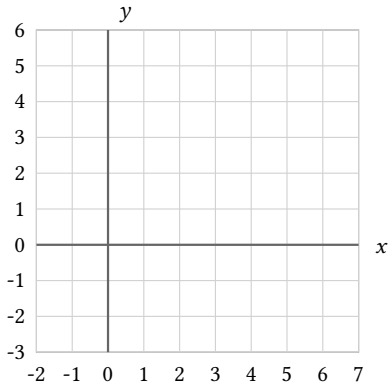
Name: _____ **Date:** _____ **Class:** _____

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.

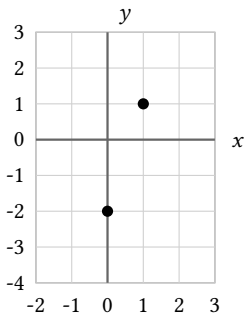
Use slope-intercept construction for $y = 2x + 3$. Which two exact points can anchor the graph?



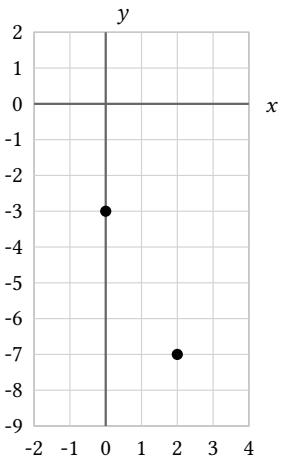
Graph $y = -x + 4$ only on the domain closed at $x = 0$ and closed at $x = 5$. Describe the exact plotted set and every endpoint style.



Use slope-intercept construction for $y = 3x - 2$. Which two exact points can anchor the graph?



Graph $y = -2x - 3$ by the intercept-and-step method. Specify the starting point and one correctly directed second point.



Algebra 1

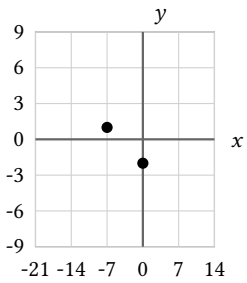
Graphing Slope-Intercept Form

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: Start at $(0, 2)$; move -2 horizontal squares and -1 vertical squares to $(-4, -3)$.

Graph $y = -(\frac{3}{7})x - 2$ from its vertical intercept on axes scaled 7 per x-square and 3 per y-square. Describe an efficient leftward step.



Your response: _____

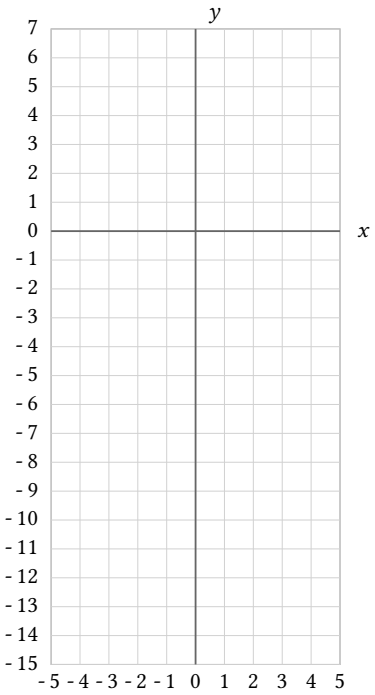
Algebra 1

Graphing Slope-Intercept Form

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

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

A student plots $(-4, 0)$ as the first anchor for $y = 3x - 4$. Correct the construction.

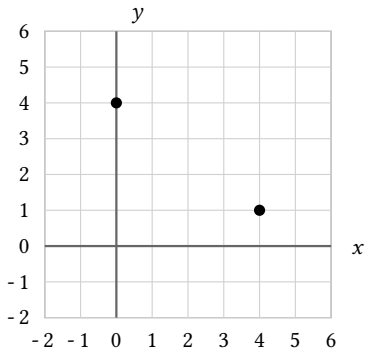


Graphing Slope-Intercept Form

Full Worked Solutions - excerpt

Worked example

Problem. Graph $y = -(\frac{3}{4})x + 4$ by the intercept-and-step method. Specify the starting point and one correctly directed second point.



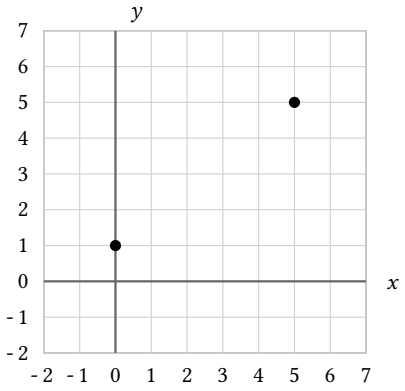
Answer. Plot $(0, 4)$ and $(4, 1)$, then extend the line for $y = -(\frac{3}{4})x + 4$.

Explanation and check.

Plot $(0, 4)$. Using run 4 and rise -3 respects the negative slope and reaches $(4, 1)$.

Worked example

Problem. Use slope-intercept construction for $y = (\frac{4}{5})x + 1$. Which two exact points can anchor the graph?



Answer. Plot $(0, 1)$ and $(5, 5)$, then extend the line for $y = (\frac{4}{5})x + 1$.

Explanation and check.

The constant gives $(0, 1)$; applying rise 4 over run 5 gives $(5, 5)$. Draw the full line through them.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Solving Systems by Graphing

Solving Systems by Graphing | A1-U06-P01

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for an exact or justified approximate common solution with verification.

8 PDFs and a README; 142 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.

Published by Tusils LLC.

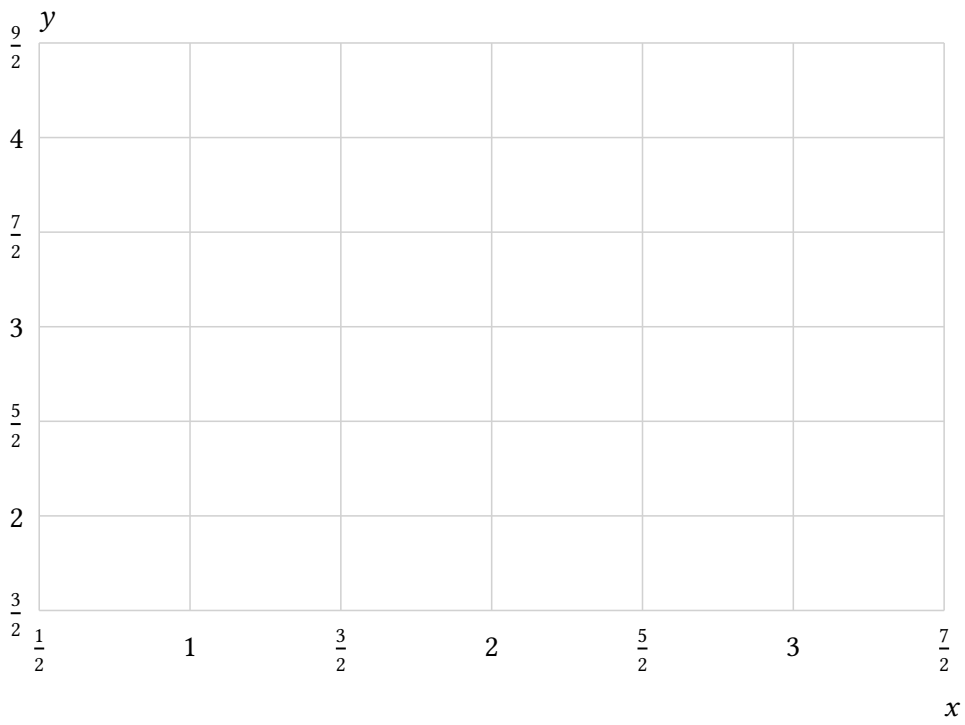
Algebra 1

Solving Systems by Graphing

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.

Graph the system $y = x + 1$ and $y = -x + 5$ on common axes. Use two exact points per line, locate the crossing, and verify the ordered pair in both equations.



Input x	Output y
1	2
3	4

Input x	Output y
1	4
3	2

Bank label: _____

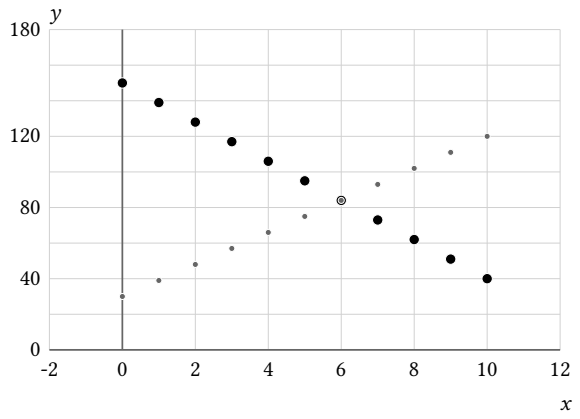
Algebra 1

Solving Systems by Graphing

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

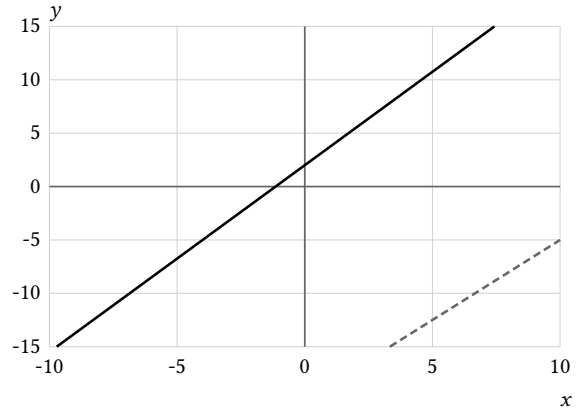
Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. A value without its unit is not a complete answer.

Two supplied contextual graphs follow $A(x) = -11x + 150$ and $B(x) = 9x + 30$ for x in $\{0, 1, \ldots, 10\}$. The input unit is orders and output unit is items. Find and interpret their intersection, then enforce the stated domain.



Test candidate point $(1, 1)$ against the system $y = 3x - 2$ and $y = -2x + 4$. Report separately whether each equation passes before deciding common membership.

A graphing panel shows $y = \frac{7}{4}x + 2$ and $y = \frac{3}{2}x - 20$ only in window $[-10, 10]x[-15, 15]$. What conclusion is warranted, and what exact feature or improved window would support it?



Test candidate point $(1, 0)$ against the system $y = 2x + 3$ and $y = -3x + 1$. Report separately whether each equation passes before deciding common membership.

Algebra 1

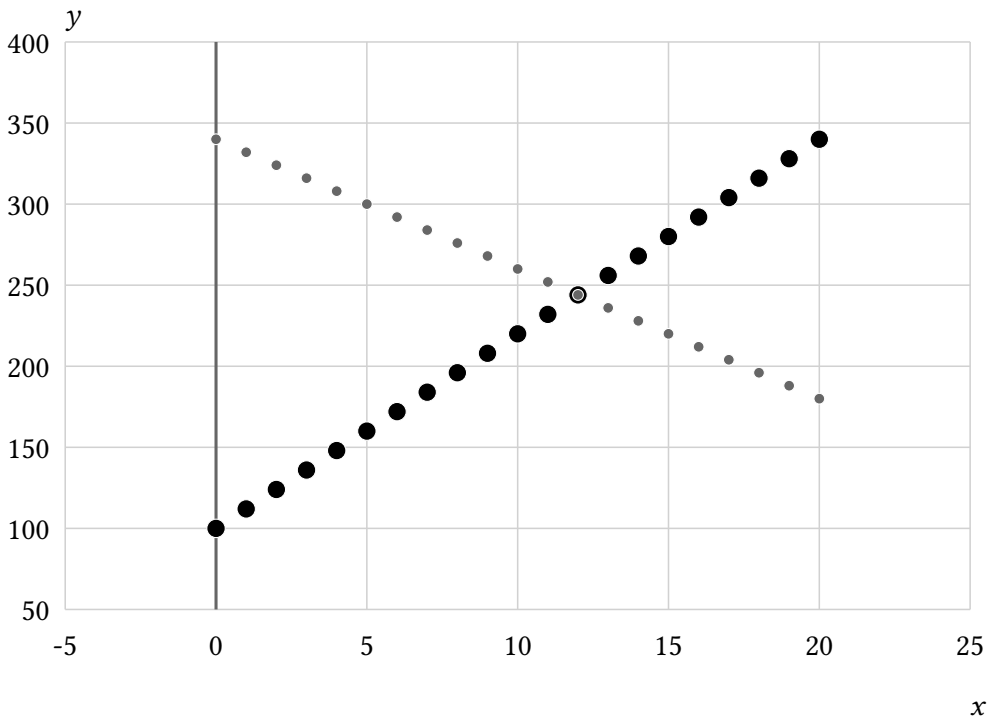
Solving Systems by Graphing

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: For y = $-4x + 7$ and $y = -4x + 7$ in window $[-1, 2]x[-2, 8]$, the lines are coincident; the crop does not change that exact relationship.

Two supplied contextual graphs follow $A(x) = 12x + 100$ and $B(x) = -8x + 340$ for x in $\{0, 1,...,20\}$. The input unit is tickets and output unit is dollars. Find and interpret their intersection, then enforce the stated domain.



Your response: _____

Algebra 1

Solving Systems by Graphing

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 graphical-system solution: Fractional graph points are rounded before the lines are drawn, moving the crossing. Identify the first plotting, scale, or common-membership error and repair it.

Audit this graphical-system solution: The equation $x = -4$ is plotted as $y = -4$. Identify the first plotting, scale, or common-membership error and repair it.

Audit this graphical-system solution: The line $y = -2x + 1$ is drawn with rise 2 for run 1. Identify the first plotting, scale, or common-membership error and repair it.

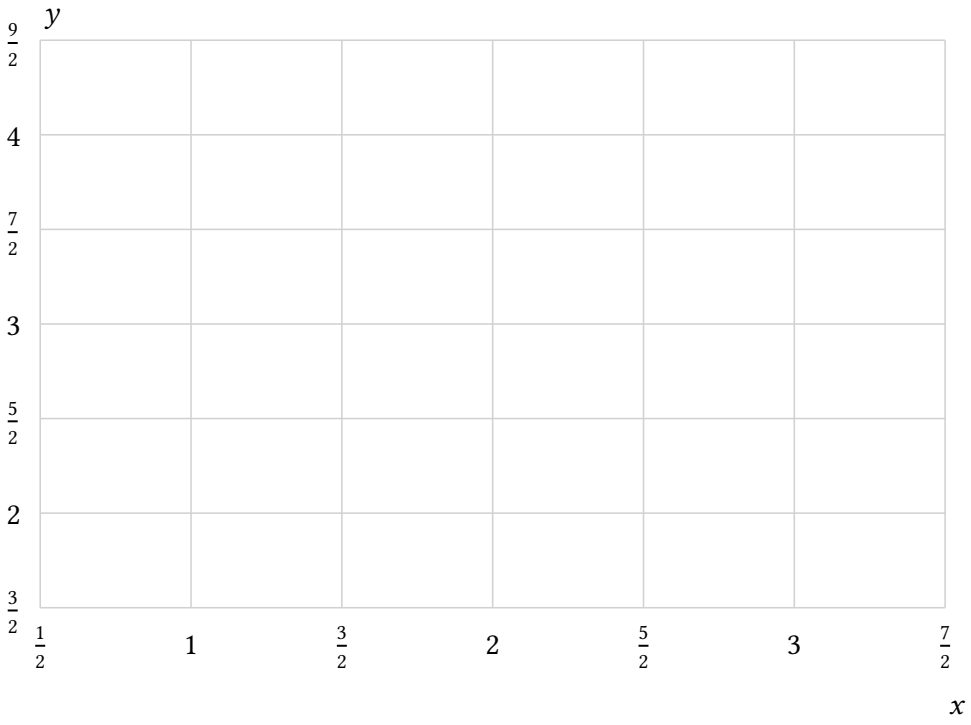
Audit this graphical-system solution: For $y = 3x - 4$, the plotted line starts at $(0, 4)$. Identify the first plotting, scale, or common-membership error and repair it.

Solving Systems by Graphing

Full Worked Solutions - excerpt

Worked example

Problem. Graph the system $y = x + 1$ and $y = -x + 5$ on common axes. Use two exact points per line, locate the crossing, and verify the ordered pair in both equations.



Input x	Output y
1	2
3	4

Input x	Output y
1	4
3	2

Answer. The graphs of y = $x + 1$ and $y = -x + 5$ intersect at $(2, 3)$, which satisfies both original equations.

Explanation and check.

Plot line 1 through $(1, 2), (3, 4)$ and line 2 through $(1, 4), (3, 2)$; their shared point is $(2, 3)$.

Worked example

Problem. Test candidate point $(2, 5)$ against the system $y = 2x + 1$ and $y = -x + 7$. Report separately whether each equation passes before deciding common membership.

Answer. For y = $2x + 1$ and $y = -x + 7$, first equation: passes; second equation: passes. Therefore $(2, 5)$ is a common solution.

Explanation and check.

Both original equations accept $(2, 5)$, so the point lies on both graphs simultaneously.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Number of Solutions in Linear Systems

Number of Solutions in Linear Systems | A1-U06-P02

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for one, none, or infinitely many solutions with exact justification.

8 PDFs and a README; 85 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.

Published by Tusils LLC.

Algebra 1

Number of Solutions in Linear Systems

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.

An exact graph marks one crossing of two genuine lines and also labels their unequal direction vectors. Is the full system count determined?

Bank label: _____

Algebra 1

Number of Solutions in Linear Systems

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.

Decide whether these genuine lines cross, remain distinct, or coincide: $2x + y = 7$ and $x - 2y = -4$. Give exact coefficient evidence.	A student must classify the system before choosing any solving method: $4x + 7y = -2$ and $12x + 21y = -6$. Give exact coefficient evidence.
A student claims $5y = 10$ and $y = -3$ must cross because their constants differ. Correct the count.	Classify this pair of standard-form equations without finding an intersection: $4x - 7y = 2$ and $-8x + 14y = -9$. Give exact coefficient evidence.
Simplify both equations before classifying the system: $2(x + y) - y = 7$ and $x - 3(y - 1) = 4$. Show the normalized pair as evidence.	A solution labels $2x + 3y = 7$ and $4x + 6y = 20$ as the same line because the variable coefficients double. Correct it.

Algebra 1

Number of Solutions in Linear Systems

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: No solution. Justification: The first equation becomes $8 = 5$, a contradiction. No point on the horizontal line can satisfy it.

Start with $x - 2y = 3$. Construct a second genuine-line equation so the system has infinitely many solutions. Constraint: The second equation must contain both $(3, 0)$ and $(5, 1)$ and differ in appearance. Give the equation and verify the complete line relation.

Your response: _____

Incoming: One valid construction is $-3x + 6y = -9$; with $x - 2y = 3$, it has infinitely many solutions. Justification: The direction cross-product is 0, and the constant checks are both 0; the equations name the same line. Therefore the construction meets the stated count and the additional constraint.

Start with $x + y = 5$. Construct a second genuine-line equation so the system has one solution. Constraint: Both equations must contain $(3, 2)$, and the second direction must differ. Give the equation and verify the complete line relation.

Your response: _____

Algebra 1

Number of Solutions in Linear Systems

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

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

A student treats $4x - y = 6$ and $6 = 4x - y$ as two different lines because the sides are reversed. Audit the system.

Complete the task, then compare two valid approaches from this topic (compare normalized equations, use slopes/intercepts, or analyze coefficient proportionality) and justify why they agree on the required conclusion. Start with $x = 4$. Construct a second genuine-line equation so the system has one solution. Constraint: Make the second line horizontal while the first is vertical. Give the equation and verify the complete line relation.

Complete the task, then compare two valid approaches from this topic (compare normalized equations, use slopes/intercepts, or analyze coefficient proportionality) and justify why they agree on the required conclusion. Start with $y = 4$. Construct a second genuine-line equation so the system has one solution. Constraint: The second line must be oblique, not another horizontal line. Give the equation and verify the complete line relation.

Choose and justify a method before solving (compare normalized equations, use slopes/intercepts, or analyze coefficient proportionality). Then complete the task: From a graph, slopes 0.333 and 0.334 are both rounded to 0.33, and the system is labeled no solution. Audit the conclusion.

Number of Solutions in Linear Systems

Full Worked Solutions - excerpt

Worked example

Problem. An exact graph marks one crossing of two genuine lines and also labels their unequal direction vectors. Is the full system count determined?

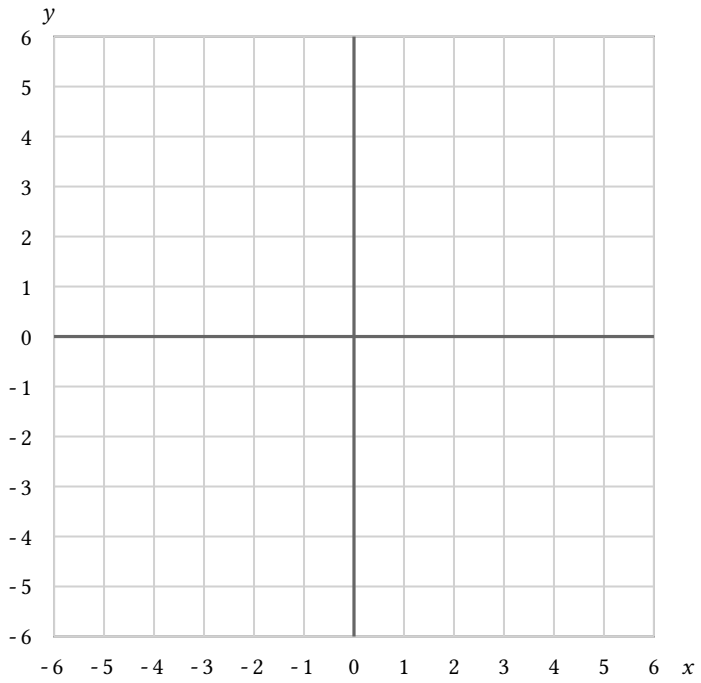
Answer. Yes. The system has one solution. Justification: The marked crossing supplies existence, and unequal directions prevent coincidence or a second meeting. Genuine lines with different directions intersect once.

Explanation and check.

The marked crossing supplies existence, and unequal directions prevent coincidence or a second meeting. Genuine lines with different directions intersect once.

Worked example

Problem. The graphing display uses the rules below: $x = 12$ and $x - y = -15$, in the window x from -6 to 6 and y from -6 to 6. The viewing note says one trace is outside the displayed x-range. Classify the complete system; do not infer from the crop alone.



Answer. The system x = 12; $x - y = -15$ has one solution. Justification: The direction cross-product is -1, not 0, so the genuine lines are nonparallel and meet once. The location of that meeting is not needed for this classification.

Explanation and check.

The direction cross-product is -1, not 0, so the genuine lines are nonparallel and meet once. The location of that meeting is not needed for this classification.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Solving Systems by Substitution

Solving Systems by Substitution | A1-U06-P03

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for first invalid step, correction, and ordered pair, ordered pair, complete solution set and missing coordinate and k.

8 PDFs and a README; 57 buyer pages.

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

Published by Tusils LLC.

Algebra 1

Solving Systems by Substitution

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.

Substitution in the system $y = 2x + 4$ and $5y = 10x + 21$ collapses to $0 = 1$. Interpret the collapsed equation. State the complete solution set and justify it using the original system. Bank label: _____	It is known that $y = 2$. The pair satisfies $5x + 5y = 0$ and $kx + 5y = 24$. Recover the missing coordinate and determine k. Explain how each equation is used. Bank label: _____
Solve the system $y = x - 2$ and $2x\text{-}y = 7$ by substitution. Then verify the ordered pair in both original equations. Bank label: _____	Neither variable is displayed alone in the system $x + 5y = 25$ and $4x + 4y = 20$. Isolate x from the first equation, use substitution to solve, and check the result in both equations. Bank label: _____
Both equations give y in terms of x: $y = (x - 1) + 11$ and $y = -2x + 1$. Equate the two expressions, then find both coordinates of the solution. Bank label: _____	Solve the system $x = -y - 12$ and $2x + 6y = -52$ by substitution. Then verify the ordered pair in both original equations. Bank label: _____
Neither variable is displayed alone in the system $6x\text{-}y = 17$ and $-4x + 6y = -38$. Isolate x from the first equation, use substitution to solve, and check the result in both equations. Bank label: _____	Both equations give y in terms of x: $y = 2x - 4$ and $y = x - 5$. Equate the two expressions, then find both coordinates of the solution. Bank label: _____

Algebra 1

Solving Systems by Substitution

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.

The data table gives $x = -5$. The pair satisfies $2x + 3y = -28$ and $4x + 3y = k$. Recover the missing coordinate and determine k. Explain how each equation is used.

given coordinate	value
x	-5

The data table gives $x = 3$. The pair satisfies $2x + 2y = 18$ and $kx + 2y = -3$. Recover the missing coordinate and determine k. Explain how each equation is used.

given coordinate	value
x	3

The data table gives $x = 2$. The pair satisfies $2x + 6y = 34$ and $5x + 3y + k = 23$. Recover the missing coordinate and determine k. Explain how each equation is used.

given coordinate	value
x	2

Substitution in the system $y = -x$ and $3y = -3x + 1$ collapses to $0 = 1$. Interpret the collapsed equation. State the complete solution set and justify it using the original system.

Substitution in the system $y = 2x + 3$ and $4y = 8x + 12$ collapses to $0 = 0$. Interpret the collapsed equation. State the complete solution set and justify it using the original system.

For the system $y = -2x + 6$ and $4x + 3y = 10$, a student writes: “Substitute: $4x + 3 \cdot -2x + 6 = 10$.” Identify the first invalid step, repair it, solve the system, and verify the ordered pair.

Algebra 1

Solving Systems by Substitution

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: $(-1, -7)$ Neither variable is displayed alone in the system $-x + 3y = 1$ and $2x + 7y = -15$. Isolate x from the first equation, use substitution to solve, and check the result in both equations. Your response: _____	**Incoming:** $(-3, -2)$ Neither variable is displayed alone in the system $3x - y = -6$ and $-3x + 4y = -3$. Isolate x from the first equation, use substitution to solve, and check the result in both equations. Your response: _____
Incoming: $(-4, -4)$ Substitution in the system $y = -2x - 2$ and $3y = -6x - 4$ collapses to $0 = 2$. Interpret the collapsed equation. State the complete solution set and justify it using the original system. Your response: _____	**Incoming:** No solution It is known that $y = -3$. The pair satisfies $3x + 4y = -21$ and $kx + 3y = 0$. Recover the missing coordinate and determine k. Explain how each equation is used. Your response: _____
Incoming: $(0, 3)$ Neither variable is displayed alone in the system $-x + 4y = 1$ and $-2x + 6y = 2$. Isolate x from the first equation, use substitution to solve, and check the result in both equations. Your response: _____	**Incoming:** $(-1, 0)$ Both equations give y in terms of x: $y = x + 2$ and $y = 2x + 4$. Equate the two expressions, then find both coordinates of the solution. Your response: _____

Algebra 1

Solving Systems by Substitution

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.

Substitution in the system $y = -3x - 5$ and $2y = -6x - 10$ collapses to $0 = 0$. A student concludes that every point in the coordinate plane works. State the complete solution set and justify it using the original system. Compare these two claims about the displayed collapsed equation: A says that it alone completely describes the solution set in the coordinate plane; B says that the solution set must satisfy both the collapsed statement and the retained original equation. Decide which reasoning is valid, explain the difference, and give the complete solution set. If the collapsed statement is false, explain why both descriptions produce an empty set.

For the system $y = -2x - 16$ and $2x + 3y = -28$, a student writes: "Substitute: $2x + 3 \cdot -2x - 16 = -28$." Identify the first invalid step, repair it, solve the system, and verify the ordered pair.

Solving Systems by Substitution

Full Worked Solutions - excerpt

Worked example

Problem. Solve the system $y = x - 2$ and $2x - y = 7$ by substitution. Then verify the ordered pair in both original equations.

Answer. $(5, 3)$

Explanation and check.

Use the isolated relation $y = x - 2$; substitution gives $x = 5$, so $x = 5$. Back-substitution gives the other coordinate, $(5, 3)$. Substituting that pair into both original equations verifies both equalities.

Worked example

Problem. Solve the system $x = 3y$ and $-2x + 5y = 2$ by substitution. Then verify the ordered pair in both original equations.

Answer. $(-6, -2)$

Explanation and check.

Use the isolated relation $x = 3y$; substitution gives $-y = 2$, so $y = -2$. Back-substitution gives the other coordinate, $(-6, -2)$. Substituting that pair into both original equations verifies both equalities.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Solving Systems by Elimination

Solving Systems by Elimination | A1-U06-P04

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for first error, corrected row, and ordered pair, complete solution set, aligned system and ordered pair, multiplier and surviving equation or impossibility justification and ordered pair.

8 PDFs and a README; 56 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.

Published by Tusils LLC.

Algebra 1

Solving Systems by Elimination

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.

Solve the system $5x + 4y = -7$ and $x - 4y = 13$ by choosing addition or subtraction so a variable cancels immediately. Verify the result in both original equations. Bank label: _____	One coefficient pair in $2x - 3y = 2$ and $2x - 2y = 4$ is already aligned. Solve by elimination. Verify the result in both original equations. Bank label: _____
Use the ready cancellation in $3x$-$y = 14$ and $-3x + 2y = -7$ to determine the ordered pair. Verify the result in both original equations. Bank label: _____	Without scaling either equation, eliminate a variable and solve the system $4x + y = -25$ and $7x + y = -40$. Verify the result in both original equations. Bank label: _____
For the system $5x + 3y = 0$ and $9x - 3y = 0$, explain whether addition or subtraction creates the cancellation, then solve. Verify the result in both original equations. Bank label: _____	For the system $3x - 3y = 15$ and $-3x - 5y = 17$, explain whether addition or subtraction creates the cancellation, then solve. Verify the result in both original equations. Bank label: _____
Choose a nonzero multiplier for one row of $x + 3y = 16$ and $7x + 9y = 28$ and solve by elimination. Check the ordered pair in both originals. Bank label: _____	Use one whole-equation scaling before combining the equations in $16x + 21y = -137$ and $4x + 4y = -28$. Check the ordered pair in both originals. Bank label: _____

Algebra 1

Solving Systems by Elimination

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.

Rewrite each equation in aligned standard form before eliminating for $2(x+2)-3y=3$ and $-3x+2y=-1$. Verify the final ordered pair in the original displayed equations.	A student's elimination work contains one first invalid step for $2x-2y=-4$ and $4x-3y=-8$: "Multiply $E1$ by 2 but leave its right side as -4." Identify the first error, give the corrected combination, solve, and verify the ordered pair.
Determine k so that $E1+$ kE2 eliminates the specified variable, and give the surviving equation for $E1$: $2x-3y=-10$ and $E2$: $3x-3y=-6$; eliminate x.	Carry out the indicated elimination and interpret the constant statement without discarding the original constraint for $x-2y=-2$ and $2x-4y=-4$ by forming $-2E1+E2$.
Simplify the system carefully, align like terms, and then solve by elimination for $5x-3y=-6+2x$ and $2x+4y=32$. Verify the final ordered pair in the original displayed equations.	The linear structure is hidden. Normalize both rows before forming an elimination combination for $0.4x+0.3y=1.0$ and $-0.4x-0.6y=0.8$. Verify the final ordered pair in the original displayed equations.

Algebra 1

Solving Systems by Elimination

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: $(0, 0)$

Scale exactly one equation in $2x - 2y = 16$ and $4x - 5y = 39$ to create cancellation, then solve. Check the ordered pair in both originals.

Your response: _____

Incoming: $(7, -2)$

Scale exactly one equation in $2x - 2y = 11$ and $4x - 7y = 16$ to create cancellation, then solve. Give the answer exactly and check it.

Your response: _____

Incoming: $(-2, 0)$

Choose a nonzero multiplier for one row of $x + 3y = -2$ and $5x + 9y = 2$ and solve by elimination. Check the ordered pair in both originals.

Your response: _____

Incoming: $(4, 2)$

Solve $3x + y = -10$ and $9x - 2y = -10$ by elimination; only one original equation needs to be multiplied. Check the ordered pair in both originals.

Your response: _____

Incoming: $(1, -7)$

Solve the system $3x + y = -5$ and $-3x + 3y = 9$ by choosing addition or subtraction so a variable cancels immediately. Verify the result in both original equations.

Your response: _____

Incoming: $(-2, -4)$

Use direct elimination to solve the system $4x + 2y = -24$ and $7x + 2y = -30$. Verify the result in both original equations.

Your response: _____

Algebra 1

Solving Systems by Elimination

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 the system $5x - 3y = -28$ and $9x + 3y = -42$, explain whether addition or subtraction creates the cancellation, then solve. Verify the result in both original equations. First choose either adding the two equations or subtracting one from the other to cancel a variable immediately, without scaling. Explain your choice using the displayed coefficients, carry out the chosen operation, solve, and verify both original equations. You need not carry out the other operation.

Carry out the indicated elimination and interpret the constant statement without discarding the original constraint for $-5x + y = -1$ and $-10x + 2y = -2$ by forming $-2E1 + E2$. After carrying out the required combination, compare these two claims about the resulting constant statement: A says that it alone completely describes the solution set in the coordinate plane; B says that the solution set must satisfy both the collapsed statement and the retained original equation. Decide which reasoning is valid, explain the difference, and give the complete solution set. If the collapsed statement is false, explain why both descriptions produce an empty set.

Solving Systems by Elimination

Full Worked Solutions - excerpt

Worked example

Problem. Use direct elimination to solve the system $2x - y = 0$ and $2x = 0$. Verify the result in both original equations.

Answer. $(0, 0)$

Explanation and check.

Subtract the second equation from the first; this gives $-y = 0$. Solving that one-variable equation gives $y = 0$. Substitution into $2x - y = 0$ gives the remaining coordinate, so the solution is $(0, 0)$. Both original equations are true at that pair.

Worked example

Problem. Find efficient multipliers for both equations and solve by elimination for $2x - y = -4$ and $3x - 4y = -6$.

Answer. $(-2, 0)$

Explanation and check.

Form $3E1 - 2E2$; this gives $5y = 0$. Solving that one-variable equation gives $y = 0$. Substitution into $2x - y = -4$ gives the remaining coordinate, so the solution is $(-2, 0)$. Both original equations are true at that pair.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Choosing a Method for Linear Systems

Choosing a Method for Linear Systems | A1-U06-P05

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for route verdict and complete corrected solution set, method, decisive feature, and first step, casewise route decision and validity reason, more efficient route and structural reason, linked entries and reversibility justification and exact witness and information-loss explanation.

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

Choosing a Method for Linear Systems

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.

For the system $y = -2x - 7$ and $2x + 2y = -8$, choose substitution or elimination as the more economical exact route. Name the structural feature and the first step; do not carry out the full solve. For the response cell, record the method and its first action; for an algebraic action show the equation before simplifying, and use $E1$ minus $E2$ if subtracting. Complete and justify every part of the original task; do not carry out a full solve when the original task forbids it. Bank label: _____	For the system $y = -x + 4$ and $3x + 2y = 8$, choose substitution or elimination as the more economical exact route. Name the structural feature and the first step; do not carry out the full solve. For the response cell, record the method and its first action; for an algebraic action show the equation before simplifying, and use $E1$ minus $E2$ if subtracting. Complete and justify every part of the original task; do not carry out a full solve when the original task forbids it. Bank label: _____
Start with $E1$: $2x - 2y = -8$ and $E2$: $-3x + 2y = 11$. Complete this proposed equivalent transformation: retain $E1$ and replace $E2$ by $-2E1 + E2 = -7x + 6y = ?$. Determine every linked entry or prove incompatibility, and explain why retaining $E1$ matters. For the response cell, record all requested missing entries, or the incompatibility conclusion. Complete and justify every part of the original task; do not carry out a full solve when the original task forbids it. Bank label: _____	For the system $y = 3x - 17$ and $4x - 3y = 36$, choose substitution or elimination as the more economical exact route. Name the structural feature and the first step; do not carry out the full solve. For the response cell, record the method and its first action; for an algebraic action show the equation before simplifying, and use $E1$ minus $E2$ if subtracting. Complete and justify every part of the original task; do not carry out a full solve when the original task forbids it. Bank label: _____

Algebra 1

Choosing a Method for Linear Systems

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.

For the original system $2x - 2y = -14$ and $-x + 2y = 11$, a student proposes to discard both originals and keep only their sum, $x = -3$. Disprove equivalence with an exact point and state whether the transformation enlarges or excludes part of the solution set.	The original system is $E1$: $3x + 2y = -10$ and $E2$: $2x + 3y = -15$. A new system is formed by the reversible operation: replace $E1$ with $-3E1$ while retaining $E2$. Prove that the complete solution sets are equal in both directions; explicitly use the retained information or inverse operation.
Two valid routes are proposed for $2x - y = -9$ and $2x + y = -15$. Route A isolates x from $2x - y = -9$, introducing division by 2, and substitutes. Route B subtracts the equations immediately, canceling $2x$. The requested answer is exact. Which route is more efficient, and why? Judge the algebraic cost and exactness rather than the number of written lines alone.	For the original system $3x - y = 8$ and $2x + 3y = -24$, a student proposes to discard both originals and keep only their sum, $5x + 2y = -16$. Disprove equivalence with an exact point and state whether the transformation enlarges or excludes part of the solution set.
Two valid routes are proposed for $3x + y = -7$ and $3x + 4y = -1$. Route A isolates x from $3x + y = -7$, introducing division by 3, and substitutes. Route B subtracts the equations immediately, canceling $3x$. The requested answer is exact. Which route is more efficient, and why? Judge the algebraic cost and exactness rather than the number of written lines alone.	Two valid routes are proposed for $4x + 3y = 21$ and $4x + 4y = 28$. Route A isolates x from $4x + 3y = 21$, introducing division by 4, and substitutes. Route B subtracts the equations immediately, canceling $4x$. The requested answer is exact. Which route is more efficient, and why? Judge the algebraic cost and exactness rather than the number of written lines alone.

Algebra 1

Choosing a Method for Linear Systems

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: elimination: $(4x + 3y) - (4x + 4y) = (36) - (40)$

For $5x$-$y = -22$ and $-5x + y = 22$, choose substitution or elimination as the more economical exact route. Cite the decisive coefficient relation and state the first operation without finishing the solve. For the response cell, record the method and its first action; for an algebraic action show the equation before simplifying, and use $E1$ minus $E2$ if subtracting. Complete and justify every part of the original task; do not carry out a full solve when the original task forbids it.

Your response: _____

Incoming: elimination: $(4x + y) - (4x + 3y) = (19) - (33)$

For $5x - 3y = 45$ and $-5x = -30$, choose substitution or elimination as the more economical exact route. Cite the decisive coefficient relation and state the first operation without finishing the solve. For the response cell, record the method and its first action; for an algebraic action show the equation before simplifying, and use $E1$ minus $E2$ if subtracting. Complete and justify every part of the original task; do not carry out a full solve when the original task forbids it.

Your response: _____

Incoming: k = 2, y-coefficient 0, constant -66.

Start with $E1$: $2x + 2y = -8$ and $E2$: $3x + 3y = -12$. Complete this proposed equivalent transformation: retain $E1$ and complete kE1 + $E2$ so its x-coefficient is 1; report k, the y-coefficient, and the constant. Determine every linked entry or prove incompatibility, and explain why retaining $E1$ matters. For the response cell, record all requested missing entries, or the incompatibility conclusion. Complete and justify every part of the original task; do not carry out a full solve when the original task forbids it.

Your response: _____

Incoming: k = 3, y-coefficient 5, constant -26.

Start with $E1$: $3x + 3y = 12$ and $E2$: $3x + 3y = 12$. Complete this proposed equivalent transformation: retain $E1$ and complete kE1 + $E2$ so its x-coefficient is 6; report k, the y-coefficient, and the constant. Determine every linked entry or prove incompatibility, and explain why retaining $E1$ matters. For the response cell, record all requested missing entries, or the incompatibility conclusion. Complete and justify every part of the original task; do not carry out a full solve when the original task forbids it.

Your response: _____

Incoming: The missing constant is -15.

For $4x - 2y = -26$ and $4x + y = -23$, choose substitution or elimination as the more economical exact route. Cite the decisive coefficient relation and state the first operation without finishing the solve. For the response cell, record the method and its first action; for an algebraic action show the equation before simplifying, and use $E1$ minus $E2$ if subtracting. Complete and justify every part of the original task; do not carry out a full solve when the original task forbids it.

Your response: _____

Incoming: elimination: $(4x - 2y) - (4x + y) = (-26) - (-23)$

For $2x - 3y = 18$ and $2x$-$y = 6$, choose substitution or elimination as the more economical exact route. Cite the decisive coefficient relation and state the first operation without finishing the solve. For the response cell, record the method and its first action; for an algebraic action show the equation before simplifying, and use $E1$ minus $E2$ if subtracting. Complete and justify every part of the original task; do not carry out a full solve when the original task forbids it.

Your response: _____

Algebra 1

Choosing a Method for Linear Systems

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 valid routes are proposed for $2x - 2y = 6$ and $2x - y = 0$. Route A isolates x from $2x - 2y = 6$, introducing division by 2, and substitutes. Route B subtracts the equations immediately, canceling $2x$. The requested answer is exact. Which route is more efficient, and why? Judge the algebraic cost and exactness rather than the number of written lines alone.

Two valid routes are proposed for $3x + 2y = -2$ and $3x + 4y = -4$. Route A isolates x from $3x + 2y = -2$, introducing division by 3, and substitutes. Route B subtracts the equations immediately, canceling $3x$. The requested answer is exact. Which route is more efficient, and why? Judge the algebraic cost and exactness rather than the number of written lines alone.

Audit this claim for $2x - 2y = 0$ and $-x + 2y = -3$: The student changes only the constant in $E1$ by 1, continues, and reports $(-3, -3)$. Check the final set against both originals and separately judge whether every transformation is set-preserving. Repair the argument.

Two valid routes are proposed for $4x + 2y = 20$ and $4x + 5y = 32$. Route A isolates x from $4x + 2y = 20$, introducing division by 4, and substitutes. Route B subtracts the equations immediately, canceling $4x$. The requested answer is exact. Which route is more efficient, and why? Judge the algebraic cost and exactness rather than the number of written lines alone.

Choosing a Method for Linear Systems

Full Worked Solutions - excerpt

Worked example

Problem. Two valid routes are proposed for $2x - 2y = 6$ and $2x - y = 0$. Route A isolates x from $2x - 2y = 6$, introducing division by 2, and substitutes. Route B subtracts the equations immediately, canceling $2x$. The requested answer is exact. Which route is more efficient, and why? Judge the algebraic cost and exactness rather than the number of written lines alone.

Answer. Route B is more efficient because it avoids early fractions and uses the ready equal x-coefficients.

Explanation and check.

For $2x - 2y = 6$ and $2x - y = 0$, both routes preserve the system, but Route B is preferable because it avoids early fractions and uses the ready equal x-coefficients. Direct checking confirms that both valid routes lead to $(-3, -6)$.

Worked example

Problem. Two valid routes are proposed for $2x - y = -9$ and $2x + y = -15$. Route A isolates x from $2x - y = -9$, introducing division by 2, and substitutes. Route B subtracts the equations immediately, canceling $2x$. The requested answer is exact. Which route is more efficient, and why? Judge the algebraic cost and exactness rather than the number of written lines alone.

Answer. Route B is more efficient because it avoids early fractions and uses the ready equal x-coefficients.

Explanation and check.

For $2x - y = -9$ and $2x + y = -15$, both routes preserve the system, but Route B is preferable because it avoids early fractions and uses the ready equal x-coefficients. Direct checking confirms that both valid routes lead to $(-6, -3)$.

Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Systems of Equations Word Problems

Systems of Equations Word Problems | A1-U06-P06

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for algebraic check, contextual verdict, and rounding analysis, equations, rates or insufficiency, and verification, balance equations, source amounts, and feasibility, equations, quantities or insufficiency, and admissibility, semantic error, corrected variables/equations, and verification and exact shared input/output or no crossing, with domain assessment.

8 PDFs and a README; 74 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

Systems of Equations Word Problems

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 record shows 12 total adult tickets and student tickets. Each adult ticket contributes 3 dollars, and each student ticket contributes 5 dollars; the combined contribution is 56 dollars. Define x and y with units, write the two equality constraints, determine the quantities if possible, and assess whether the result is admissible. For the response cell, record the exact algebraic pair (x, y), using the units defined in this question. Still provide the full model, checks and contextual admissibility assessment in your work.

Bank label: _____

Unknown component contributions x and y are constant across measurements. Measurement 1 has X-multiplicity 1 and Y-multiplicity 2 for total 19; Measurement 2 has multiplicities 2 and 2 for total 26. Build the weighted-sum system from the table, determine x and y if identifiable, and check every measured total. For the response cell, record the exact algebraic pair (x, y), using the units defined in this question. Still provide the full model, checks and contextual admissibility assessment in your work.

measurement	X multiplicity	Y multiplicity	measured total
1	1	2	19
2	2	2	26

Bank label: _____

A record shows 21 total standard tasks and bonus tasks. Each standard task contributes 6 credits, and each bonus task contributes 11 credits; the combined contribution is 191 credits. Define x and y with units, write the two equality constraints, determine the quantities if possible, and assess whether the result is admissible. For the response cell, record the exact algebraic pair (x, y), using the units defined in this question. Still provide the full model, checks and contextual admissibility assessment in your work.

Bank label: _____

A technician must make 14 liters of a mixture with $\frac{485}{14}\%$ active ingredient using Source A at 15% and Source B at 40%. Let x and y be liters from A and B. Use the table data to write total-volume and active-component equations, solve exactly, and decide whether the mixture is physically feasible. For the response cell, record the exact algebraic pair (x, y), using the units defined in this question. Still provide the full model, checks and contextual admissibility assessment in your work.

source	concentration	amount liters	active liters
A	$\frac{3}{20}$	x	$\frac{3}{20}x$
B	$\frac{2}{5}$	y	$\frac{2}{5}y$
target	$\frac{97}{280}$	14	$\frac{97}{20}$

Bank label: _____

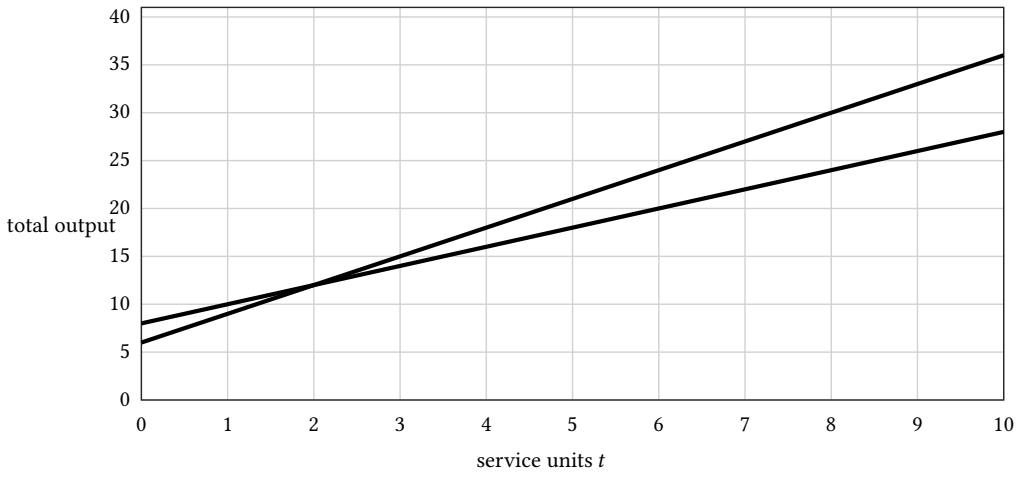
Algebra 1

Systems of Equations Word Problems

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.

Plan A has output $A(t) = 8 + 2t$ and Plan B has output $B(t) = 6 + 3t$, where t is a nonnegative number of service units. Build the equality model, determine any shared input and output exactly, and decide whether it is a meaningful break-even point. Use the exact graph rules and scale in the provided data.



Algebra 1

Systems of Equations Word Problems

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: x = 14 and $y = 16$; the pair is admissible as item counts.

Two drones leave the same marker in opposite directions at constant speeds x and y kilometers per hour. In Trial 1, drone X flies for 3 hours and drone Y for 6 hours, placing them 75 kilometers apart. In Trial 2, their flight times are 3 hours and 1 hour and their separation is 20 kilometers. Build the two rate-time equations from the table, determine both speeds, and verify both separations. For the response cell, record the exact algebraic pair (x, y), using the units defined in this question. Still provide the full model, checks and contextual admissibility assessment in your work.

observation	X hours	Y hours	separation km
1	3	6	75
2	3	1	20

Your response: _____

Incoming: x = 4 and $y = 12$; the pair is admissible as item counts.

Two constant production rates x and y are measured in units per hour. Observation 1 runs process X for 4 hours and process Y for 4 hours, producing 48 units total. Observation 2 uses 5 hours and 2 hours respectively and produces 48 units. Build the two rate-time equations from the table, determine both rates if the observations identify them, and verify against both totals. For the response cell, record the exact algebraic pair (x, y), using the units defined in this question. Still provide the full model, checks and contextual admissibility assessment in your work.

observation	X hours	Y hours	total units
1	4	4	48
2	5	2	48

Your response: _____

Incoming: x = 8 units/hour and $y = 1$ unit/hour.

A record shows 18 total small boxes and large boxes. Each small box contributes 5 kilograms, and each large box contributes 9 kilograms; the combined contribution is 138 kilograms. Define x and y with units, write the two equality constraints, determine the quantities if possible, and assess whether the result is admissible. For the response cell, record the exact algebraic pair (x, y), using the units defined in this question. Still provide the full model, checks and contextual admissibility assessment in your work.

Your response: _____

Incoming: x = 9 and $y = 5$; the result is admissible. It comes from $x + y = 14$ and x-$y = 4$.

Unknown component contributions x and y are constant across measurements. Measurement 1 has X-multiplicity 3 and Y-multiplicity 6 for total 24; Measurement 2 has multiplicities 3 and 4 for total 18. Build the weighted-sum system from the table, determine x and y if identifiable, and check every measured total. For the response cell, record the exact algebraic pair (x, y), using the units defined in this question. Still provide the full model, checks and contextual admissibility assessment in your work.

measurement	X multiplicity	Y multiplicity	measured total
1	3	6	24
2	3	4	18

Your response: _____

Algebra 1

Systems of Equations Word Problems

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

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

A model uses x and y under this domain requirement: nonnegative whole-number item counts. The stored equations are $x + y = 10$ and $2x + 3y = \frac{57}{2}$, and an algebraic solver reports $(\frac{3}{2}, \frac{17}{2})$. Assess the pair in context, explain whether rounding is allowed, and verify the original equalities. Compare algebraic validity with contextual admissibility, and justify the rounding conclusion using the actual equalities and stated domain.

Context: x and y count two item types; there are 22 items total, valued at 3 and 5 credits each, with combined value 92 credits. A student proposes $3x + 5y = 22$ and $3x + 5y = 92$. Identify the first semantic mismatch before solving, state the corrected two-equation model with variable units, and verify that the repaired model represents the context.

Context: x and y count two item types; there are 6 items total, valued at 4 and 6 credits each, with combined value 34 credits. A student proposes $4x + 6y = 6$ and $4x + 6y = 34$. Identify the first semantic mismatch before solving, state the corrected two-equation model with variable units, and verify that the repaired model represents the context.

One measurement of two unknown per-unit contributions gives $2x + 4y = 54$. A second measurement must use nonnegative integer multiplicities and be compatible with the same contributions. Compare candidates A: $4x + 8y = 108$, B: $2x + 4y = 56$, and C: $5x + 4y = 63$. Select the observation that uniquely identifies x and y, and explain why the other two fail without using a determinant formula.

Systems of Equations Word Problems

Full Worked Solutions - excerpt

Worked example

Problem. For two account balances in dollars, the conditions are: x is 6 more than y, and the stated total condition is $x + y = 18$ when x and y use the units named in context. Translate the comparison with the correct reference quantity, solve the two equality constraints, and assess whether both quantities are admissible.

Answer. x = 12 and $y = 6$; the result is admissible. It comes from $x + y = 18$ and $x - y = 6$.

Explanation and check.

The total condition is $x + y = 18$. The relationship 'x is 6 more than y' becomes $x - y = 6$. Solving the two independent equations gives $x = 12$ and $y = 6$. Both quantities satisfy the stated relationship and domain.

Worked example

Problem. For two collections of items, the conditions are: x is 4 times as large as y, and the stated total condition is $x + y = 10$ when x and y use the units named in context. Translate the comparison with the correct reference quantity, solve the two equality constraints, and assess whether both quantities are admissible.

Answer. x = 8 and $y = 2$; the result is admissible. It comes from $x + y = 10$ and $x - 4y = 0$.

Explanation and check.

The total condition is $x + y = 10$. The relationship 'x is 4 times as large as y' becomes $x - 4y = 0$. Solving the two independent equations gives $x = 8$ and $y = 2$. Both quantities satisfy the stated relationship and domain.