Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Linear Systems and Solution Methods

6-topic bundle | 576 problems | Four activity formats

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01 **Solving Systems by Graphing**

View individual product and its full preview

02 **Number of Solutions in Linear Systems**

View individual product and its full preview

03 **Solving Systems by Substitution**

View individual product and its full preview

04 **Solving Systems by Elimination**

View individual product and its full preview

05 **Choosing a Method for Linear Systems**

View individual product and its full preview

06 **Systems of Equations Word Problems**

View individual product and its full preview

In every topic

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

Product previews

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

48 PDFs and 6 READMEs; 478 buyer PDF pages across the 6 products.

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

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

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Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Solving Systems by Graphing

Solving Systems by Graphing | A1-U06-P01

96 problems · Four activity formats

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

Topic focus

Across 96 tasks this topic asks for 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.

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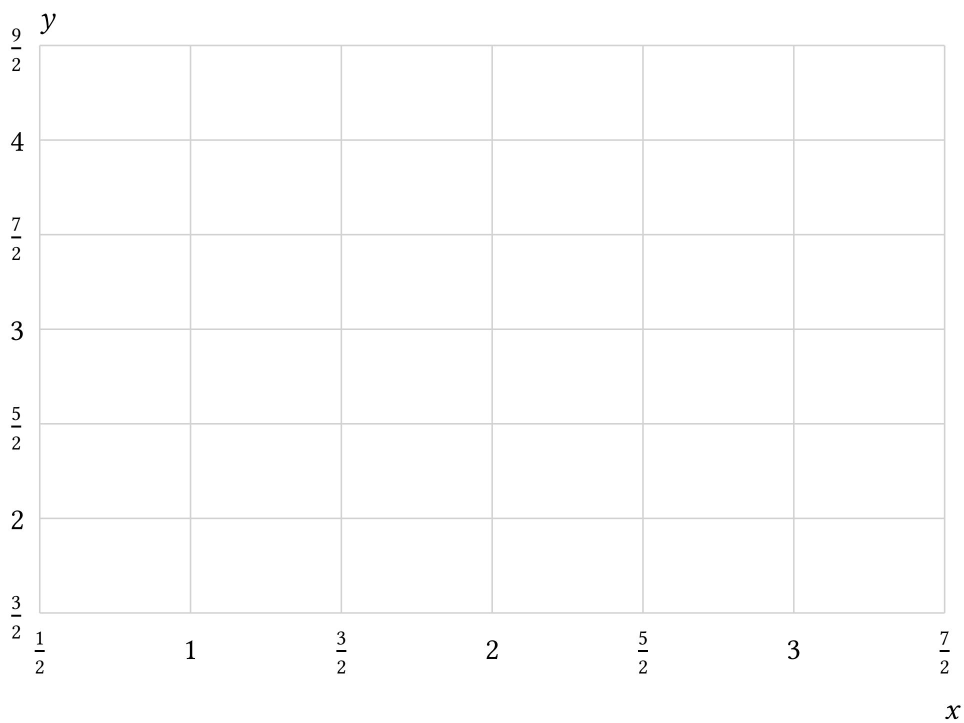
Algebra 1

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: ______

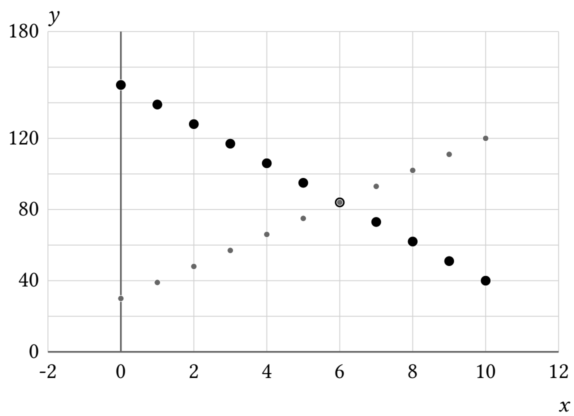
Algebra 1

Solving Systems by Graphing

Name: ______________ **Date:** ______________ **Class:** ______________

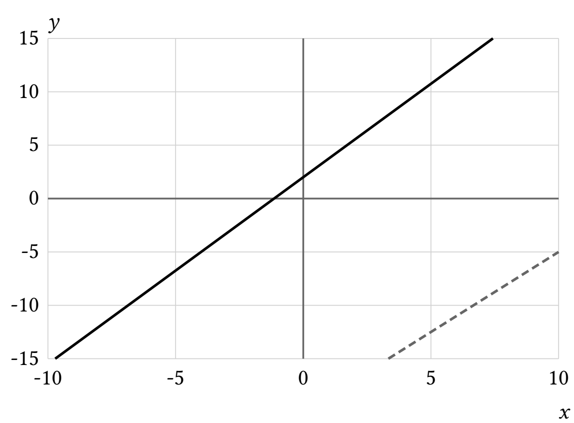
Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. A value without its unit is not a complete answer.

Two supplied contextual graphs follow $A(x) = -11x + 150$ and $B(x) = 9x + 30$ for x in $\{0, 1, ..., 10\}$. 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

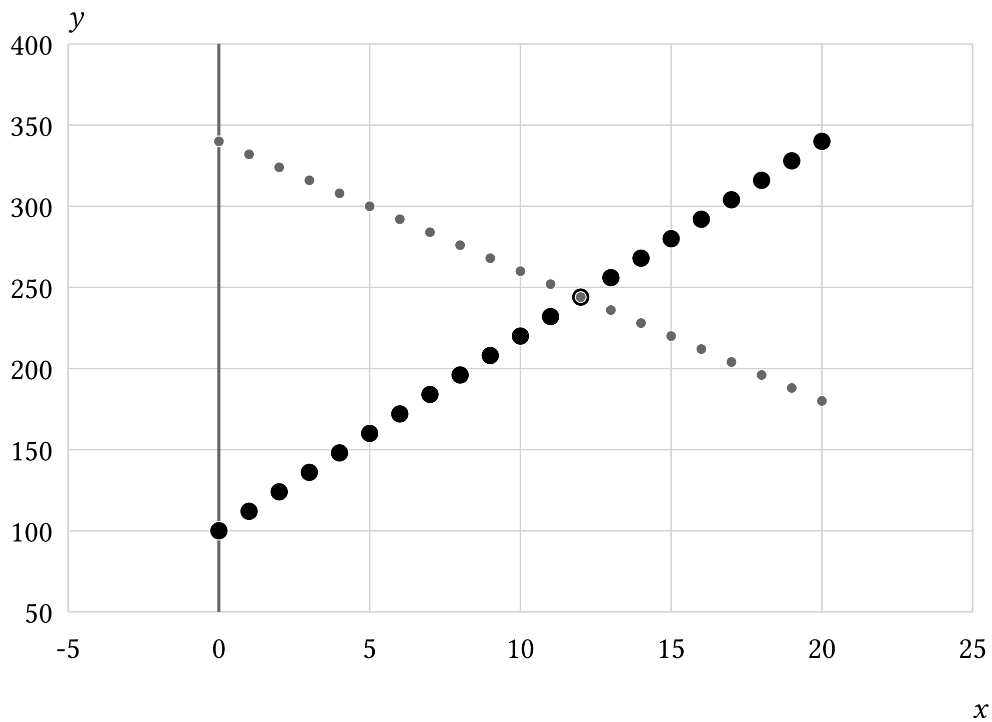
Solving Systems by Graphing

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.

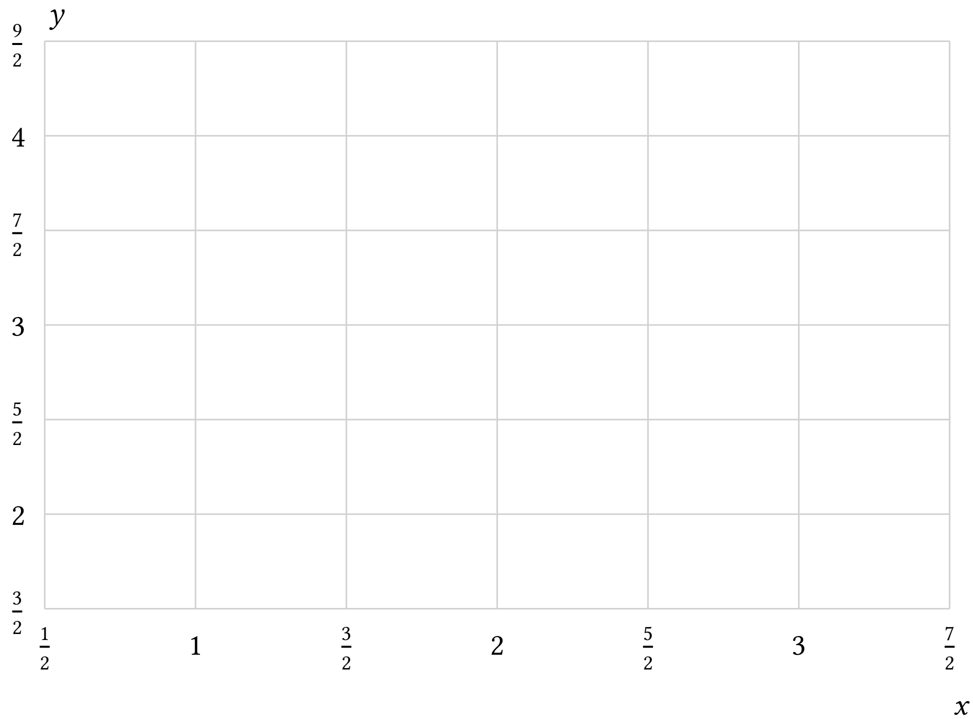
Audit this graphical-system solution: For $y = 3x - 4$, the plotted line starts at $(0, 4)$. Identify the first plotting, scale, or common-membership error and repair it.

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

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08	Terms of Use & License	included

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.

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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?

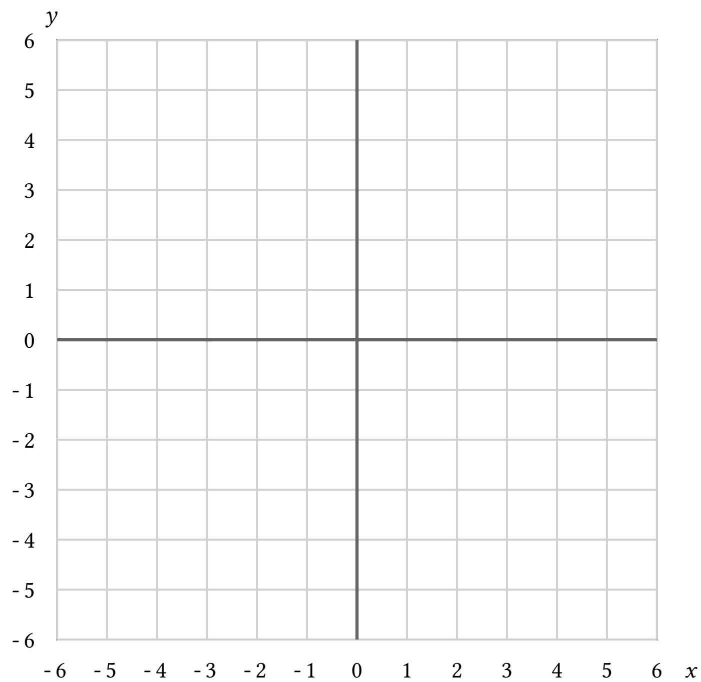
Answer. Yes. The system has one solution. Justification: The marked crossing supplies existence, and unequal directions prevent coincidence or a second meeting. Genuine lines with different directions intersect once.

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

01	Answer Bank Challenge	24 tasks
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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.

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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

01	Answer Bank Challenge	24 tasks
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08	Terms of Use & License	included

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.

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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

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
03	Match & Move	24 cards
04	Error Analysis & Strategy	24 tasks
05	Quick Answer Key	96 answers
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07	Teacher / Parent Use Guide	included
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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

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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: ______

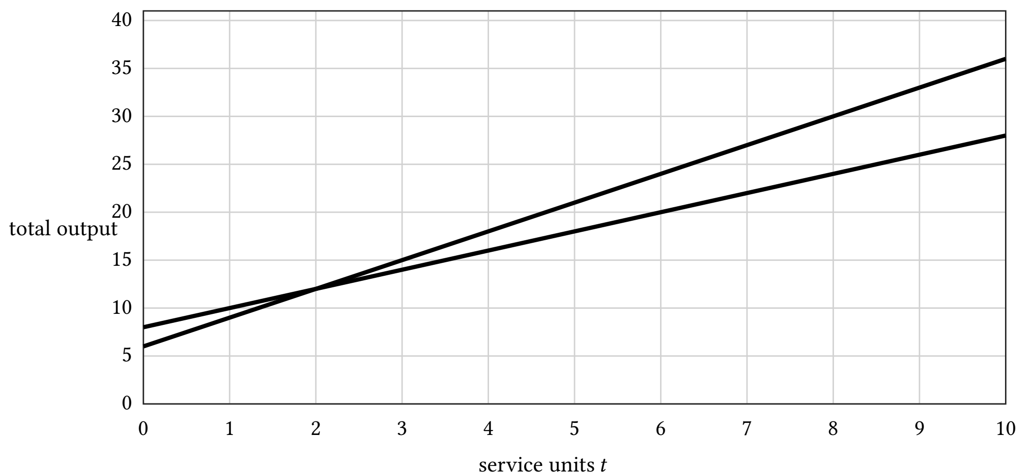
Algebra 1

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 $\left(\frac{3}{2}, \frac{17}{2}\right)$. 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: $4x + 8y = 108, B\colon\ 2x + 4y = 56$, and $C\colon\ 5x + 4y = 63$. 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.