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

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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: _____

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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.

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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: _____

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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.

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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 $(-6, -3)$.