Sets & Steps
Math Practice & Worked Solutions

Algebra 1
Solving Linear Equations

6-topic bundle | 576 problems | Four activity formats

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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; 300 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

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.

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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: _____

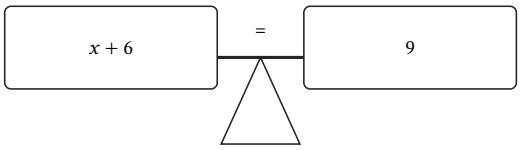
Under the stated domain $[-2, -1, 0, 1, 2]$, compare the complete solution sets of $x = 2$ and $(x - 2)(x + 1) = 0$. Use direct membership or the supplied finite domain rather than visual similarity, then state whether the equations are equivalent.

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.

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 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.

Published by Tusils LLC.

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.