

Algebra 1
Linear Equations Collection | Algebra 1 | 11-Topic Bundle

11-topic bundle | 1,056 problems | Four activity formats

Included topics

The following pages list all 11 included resources in the suggested order, with a link to each product. Each resource retains its complete preview.

In every topic

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

Product previews

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

88 PDFs and 11 READMEs; 558 buyer PDF pages across the 11 products.

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

Sets & Steps

Math Practice & Worked Solutions

Algebra 1

Included topics

11-topic bundle | 1,056 problems | Four activity formats

01 Equality and One-Step Additive Equations

[View individual product and its full preview](#)

02 One-Step Multiplication and Division Equations

[View individual product and its full preview](#)

03 Two-Step Equations

[View individual product and its full preview](#)

04 Equations with the Distributive Property

[View individual product and its full preview](#)

05 Equations with Like Terms

[View individual product and its full preview](#)

06 Linear Equations: Solving, Coefficients & Reasoning

[View individual product and its full preview](#)

07 Linear Equations: One, None, or All Real Solutions

[View individual product and its full preview](#)

08 Linear Equations with Fractions and Decimals

[View individual product and its full preview](#)

09 Literal Equations

[View individual product and its full preview](#)

10 Writing Linear Equations from Word Problems

[View individual product and its full preview](#)

11 Checking Linear Models and Contextual Solutions

[View individual product and its full preview](#)

11 included resources | Complete resource previews follow this guide.

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Algebra 1
Equality and One-Step Additive Equations

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

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 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.

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: _____

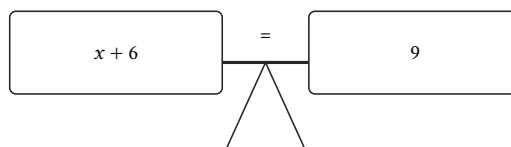
Under the stated domain $[-2, -1, 0, 1, 2]$, compare the complete solution sets of $x = 2$ and $(x - 2)(x + 1) = 0$. Use direct membership or the supplied finite domain rather than visual similarity, then state whether the equations are equivalent.

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: _____

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.

Algebra 1
One-Step Multiplication and Division Equations

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

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
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Topic focus
Across 96 tasks this topic asks for 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.

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 .

Algebra 1

Two-Step Equations

Two-Step Equations | A1-U02-P04

96 problems · Four activity formats

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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.

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 $x \rightarrow$ multiply by 3 $\rightarrow$ add 5 $\rightarrow$ 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 $x \rightarrow$ multiply by $-4 \rightarrow$ add 7 $\rightarrow$ 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 $x \rightarrow$ multiply by $\frac{1}{2} \rightarrow$ add $-3 \rightarrow$ 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 $x \rightarrow$ add 9 $\rightarrow$ divide by $-5 \rightarrow$ 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 $x \rightarrow$ multiply by 3 $\rightarrow$ add 5 $\rightarrow$ 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.

Algebra 1
Equations with the Distributive Property

Equations with the Distributive Property | A1-U02-P05

96 problems · Four activity formats

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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.

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: _____

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.

Algebra 1
Equations with Like Terms

Equations with Like Terms | A1-U02-P06

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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.

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.

Algebra 1
Linear Equations: Solving, Coefficients & Reasoning

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

96 problems · Four activity formats

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

Topic focus

Across 96 tasks this topic asks for 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.

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.

Algebra 1
Linear Equations: One, None, or All Real Solutions

Multi-Step Equations: One, No, or Infinitely Many Solutions | A1-U02-P08

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 constructed equation and coefficient-constant verification, first error, corrected class, and solution-set meaning, local forms, solution class, complete set, and justification, parameter conditions and all corresponding solution classes, permitted edit or impossibility proof and resulting class and real classification, domain intersection, and actual set.

8 PDFs and a README; 50 buyer pages.

Algebra 1

Linear Equations: One, None, or All Real Solutions

Name: _____ Date: _____ Class: _____

Solve each question and match the whole requested response. If two bank entries express the same result, either label is accepted; labels may be reused. Give exact values and any requested reasoning.

Classify $-2(4x - 3) + 5 = 4(-2x + 1) + 7$ after carrying every outer factor through its group. Give the full solution set. _____ Bank label: _____	The equation $2x + 7 = 2x + 11$ is considered only for x in $\{-3, 1, 5\}$. Find the actual set after both algebra and domain restriction. _____ Bank label: _____
Break the current degeneracy in $-2x + 9 = -2x + 9$ using only the left x-coefficient so the result has one real solution. Verify the new class. _____ Bank label: _____	Find when $(k + \frac{9}{4})x + \frac{11}{8} = (-\frac{3}{5})x + \frac{11}{8}$ becomes an identity. Also state the solution class for every remaining k. _____ Bank label: _____
Analyze the cancellation in $-6x - 5 + 3x + 8 = -x + 4 - 2x - 8$. Explain what remains and classify every possible value of x. _____ Bank label: _____	For $6x + 1 = 2x + 13$, the allowed domain is $[0, 4]$. Determine the actual solution set and show whether the algebraic root is admitted. _____ Bank label: _____
Partition all real values of k by the number of solutions of $(k - \frac{7}{8})x + \frac{13}{10} = (\frac{5}{6})x - \frac{4}{7}$. Identify the exceptional coefficient condition first. _____ Bank label: _____	Reduce $2(-5x + 6) + 3 = 5(-x - 1) + 35$ to $Ax + B = Cx + D$, compare both totals, and report the entire solution set. _____ Bank label: _____

Algebra 1

**Linear Equations: One, None,
or All Real Solutions**

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 explicitly linear equation $3x + 5 = 3x + 5$, the table shows equality at distinct inputs $x = -2$ and $x = 4$. Evaluate the claim that the equation holds for all real x , using only justified implications.

Audit this work for $3x + 5 = x + 5$: 'The constants cancel, so $x = 0$. Therefore there are no solutions.' Identify the first conceptual error and give the correct complete solution set.

For $2x + 1 = 2x + 4$, the table reports $x = 0$, left=1, and right=4. Does this evidence support the claim that the equation is an identity? Give the strongest warranted conclusion.

A student classifies $4x + 7 = 4x + 7$ using: 'Everything cancels to $0 = 0$, so the only solution is $x = 0$.' Diagnose the meaning of $0 = 0$ and correct the conclusion.

Linear Equations: One, None, or All Real Solutions

Full Worked Solutions - excerpt

Worked example

Problem. Classify $5x - 3 = 2x + 9$ over the restricted domain $\{-4, 0, 3\}$; an algebraic root outside that set must be excluded.

Answer. empty solution set

Explanation and check.

Over the reals the equation has one real solution; solution set $\{4\}$. Intersecting that set with $\{-4, 0, 3\}$ gives empty solution set.

Worked example

Problem. Intersect the real solution set of $7x - 2 = 7x - 2$ with the interval $[-3, 5]$. Report the resulting set exactly.

Answer. $[-3, 5]$

Explanation and check.

Over the reals the equation has all real numbers. Intersecting that set with $[-3, 5]$ gives $[-3, 5]$.

Algebra 1
Linear Equations with Fractions and Decimals

Solving Linear Equations with Fractional Coefficients | A1-U02-P09

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 both routes, compared intermediate equations, and justification of equal solution sets, common multiplier, fully scaled equation, exact solution, and check, common multiplier, preserved numerator groups, exact solution, and verification, exact root, rounded result, and changed-equation verdict, first error, fully corrected scaled equation, and solution and method choice, structural justification, exact solution, and check.

8 PDFs and a README; 51 buyer pages.

Algebra 1

Linear Equations with Fractions and Decimals

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.

Find a common multiplier for the unrelated denominators in $(\frac{3}{4})x + \frac{2}{5} = (\frac{1}{6})x + \frac{41}{15}$, apply it to every term on both sides, and solve. _____ Bank label: _____	Clear the constant denominators in $-(\frac{5}{6})x + \frac{7}{8} = (\frac{1}{4})x + \frac{33}{8}$ while preserving all negative signs. State the exact solution. _____ Bank label: _____
Use the shared factors among the denominators of $(\frac{7}{10})x - \frac{3}{5} = -(\frac{2}{15})x + \frac{22}{5}$ to choose an efficient clearing multiplier. Solve exactly. _____ Bank label: _____	Find a common multiplier for the unrelated denominators in $(\frac{2}{9})x + \frac{5}{6} = (\frac{7}{12})x + \frac{41}{18}$, apply it to every term on both sides, and solve. _____ Bank label: _____
Clear denominators in $(\frac{5}{14})x + 3 = (\frac{1}{7})x + \frac{33}{7}$; remember that the visible integer term must receive the same multiplier. Find x. _____ Bank label: _____	Use the shared factors among the denominators of $(\frac{9}{16})x - \frac{5}{12} = (\frac{3}{8})x + \frac{43}{48}$ to choose an efficient clearing multiplier. Solve exactly. _____ Bank label: _____
Find a common multiplier for the unrelated denominators in $(\frac{11}{18})x + \frac{7}{20} = -(\frac{5}{12})x - \frac{431}{90}$, apply it to every term on both sides, and solve. _____ Bank label: _____	Find a common multiplier for the unrelated denominators in $(\frac{7}{24})x + \frac{11}{14} = (\frac{5}{16})x + \frac{67}{112}$, apply it to every term on both sides, and solve. _____ Bank label: _____

Algebra 1

Linear Equations with Fractions and Decimals

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: $\frac{23}{12}$ Find a common multiplier for the unrelated denominators in $(\frac{23}{45})x + \frac{31}{56} = -(\frac{17}{30})x + \frac{8767}{2520}$, apply it to every term on both sides, and solve. Your response: _____	Incoming: $\frac{19}{7}$ For $-(\frac{29}{48})x - \frac{35}{54} = (\frac{11}{20})x + \frac{46139}{17280}$, justify a nonzero common multiplier, write the full integer-coefficient equation it creates, and solve exactly. Your response: _____
Incoming: $-\frac{17}{6}$ Choose a common denominator for all grouped fractions in $\frac{19x+7}{32} + \frac{-9x-13}{21} = \frac{6x-\frac{85357}{1344}}{26} + \frac{23}{12}$. Show the intact groups after scaling, then solve. Your response: _____	Incoming: $-\frac{29}{9}$ Choose a common denominator for all grouped fractions in $\frac{9x+25}{40} + \frac{-11x+16}{33} = \frac{5x-\frac{82789}{1760}}{36} + \frac{31}{16}$. Show the intact groups after scaling, then solve. Your response: _____
Incoming: $-\frac{17}{9}$ For $(\frac{17}{36})x - \frac{25}{42} = -(\frac{11}{27})x + \frac{1279}{756}$, justify a nonzero common multiplier, write the full integer-coefficient equation it creates, and solve exactly. Your response: _____	Incoming: 3 Clear the constant denominators in $-(\frac{2}{3})x + 1 = (\frac{1}{3})x + 3$ while preserving all negative signs. State the exact solution. Your response: _____

Algebra 1

Linear Equations with Fractions and Decimals

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 $\frac{3x+5}{4} = 7$, choose between immediate inverse operations and clearing every denominator. Select the more efficient valid route and solve.

Compare the exact equation $(\frac{1}{3})x + 2 = (\frac{1}{5})x + \frac{38}{15}$ with the version using a rounded coefficient. Solve both exactly as written and decide whether their roots agree.

Audit the claimed clearing step $(\frac{1}{2})x + 3 = (\frac{1}{4})x + 5 \rightarrow 6x + 3 = 3x + 60$. Find the first term that failed to receive the common multiplier and repair the equation.

Which method avoids unnecessary expansion in $\frac{-2x+7}{5} = -3$: direct rational isolation or a common scale? Justify and find x .

Linear Equations with Fractions and Decimals

Full Worked Solutions - excerpt

Worked example

Problem. Find a common multiplier for the unrelated denominators in $(\frac{3}{4})x + \frac{2}{5} = (\frac{1}{6})x + \frac{41}{15}$, apply it to every term on both sides, and solve.

Answer. 4

Explanation and check.

Multiplying every term of $(\frac{3}{4})x + \frac{2}{5} = (\frac{1}{6})x + \frac{41}{15}$ by 60 gives $45x + 24 = 10x + 164$. Its coefficient difference is 35, so $x = 4$; substitution verifies the original rational equation.

Worked example

Problem. Clear the constant denominators in $-(\frac{5}{6})x + \frac{7}{8} = (\frac{1}{4})x + \frac{33}{8}$ while preserving all negative signs. State the exact solution.

Answer. -3

Explanation and check.

Multiplying every term of $-(\frac{5}{6})x + \frac{7}{8} = (\frac{1}{4})x + \frac{33}{8}$ by 24 gives $-20x + 21 = 6x + 99$. Its coefficient difference is -26, so $x = -3$; substitution verifies the original rational equation.

Algebra 1
Literal Equations

Literal Equations | A1-U02-P10
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 factored target coefficient, isolated form, and nonzero condition, first error, corrected form, and all conditions, isolated form and every denominator/divisor condition, isolated form or complete compatibility class, regular isolated form and both exceptional compatibility classes and useful solved form, units, and assumptions.
8 PDFs and a README; 50 buyer pages.

Algebra 1

Literal Equations

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 $Y - (a + b) = (-q)v$, keep the summed symbolic coefficient or shift grouped while solving for v. State the exact divisor restriction. _____ Bank label: _____	For a laboratory reading, rearrange the conversion formula $F = (\frac{9}{5})C + 32$ for the requested input F in degrees Fahrenheit. Preserve its scale condition. _____ Bank label: _____
Isolate s in $M = (5k)s + u - v$. Undo the shift before the symbolic scale and state the condition required for division. _____ Bank label: _____	For a short-term loan, which solved form of $I = Prt$ directly finds t in years? Rearrange it and state the operating assumption. _____ Bank label: _____
Solve $(-2p)h + c + d = B$ for h. Track the negative symbolic coefficient and state when the final quotient is defined. _____ Bank label: _____	For a fabric conversion, rearrange the conversion formula $y = kx + b$ for the requested input x in yards. Preserve its scale condition. _____ Bank label: _____
Rearrange $B = \frac{c}{(d)n}$ for n, treating the product in the denominator as a whole. List every factor that must be nonzero. _____ Bank label: _____	A surveyed parcel requires dimension b in meters. Isolate it from $A = \frac{bh}{2}$ and state why the divisor must be nonzero. _____ Bank label: _____

Algebra 1

Literal 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 rearrangement of $y = (a)x + b$: $x = \frac{y}{a} - (b)$. Identify the first invalid division and give the corrected condition-aware form.

Check the target factoring in the proposed work $Q = (m)t + (n)t + c \rightarrow t = \frac{Q-(c)}{m-(n)}$. Repair the first coefficient error and state the divisor restriction.

For $v = \frac{(k)u+h}{j}$, a student writes $u = (j)\frac{v}{k} - (h)$. Diagnose the lost grouping, restore the complete numerator, and list original exclusions.

Audit this rearrangement of $B = (c + d)n + e$: $n = \frac{B}{c+d} - (e)$. Identify the first invalid division and give the corrected condition-aware form.

Literal Equations

Full Worked Solutions - excerpt

Worked example

Problem. Isolate v in $(h - (k))v = s$ for the nondegenerate parameter case, naming the exact combined coefficient condition.

Answer. $v = \frac{s}{h-(k)}$; condition $h - (k) \neq 0$

Explanation and check.

In $(h - (k))v = s$, the decisive target coefficient is $h - (k)$. The combined coefficient is nonzero, so division gives $v = \frac{s}{h-(k)}$.

Worked example

Problem. Solve $v = d - (k)u$ for u . Track the negative symbolic coefficient and state when the final quotient is defined.

Answer. $u = \frac{d-v}{k}$; condition $k \neq 0$

Explanation and check.

From $v = d - (k)u$, remove the complete shift on both sides, leaving the target multiplied by k . Division by that whole factor gives $u = \frac{d-v}{k}$, valid when $k \neq 0$.

Algebra 1
Writing Linear Equations from Word Problems

Modeling with Linear Equations (Mixture and Applications) | A1-U02-P11

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 all correct equations and a term-to-context justification, average equation and missing value, conservation equation and component amount, context, variable meaning and units, solved interpretation, and feasibility check, equality equation and matching input and equation and original reference amount.

8 PDFs and a README; 58 buyer pages.

Algebra 1

Writing Linear Equations from Word Problems

Name: _____ Date: _____ Class: _____

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

A quantitative relationship is described by these labeled values: A25-liter blend uses 80% and 30% solutions and contains 12.5 liters of active ingredient. Let x be liters of the 80% solution. Account for both component weights without treating their counts as independent; then solve and check the total. _____ Bank label: _____	A quantitative relationship is described by these labeled values: A12-kilogram mixture uses powders labeled 0.06 g/g and 20 g/kg and contains 400 g of active material. Let x be kilograms of the first powder. First reconcile the concentration units, then use the fixed total to write and solve one equation for x. _____ Bank label: _____
A lab has 50 grams of salt. Each identical batch uses 2.75 grams, and 28 grams remain. Build a one-variable equation for this total. Explain the sign of the rate before interpreting the root. _____ Bank label: _____	A tank starts with 94 liters and drains 7 liters each minute until 45 liters remain. Define the unknown, translate the fixed and repeated contributions into one equation, solve, and attach the requested unit. _____ Bank label: _____
Four sample masses average 12.5 grams. Three masses are 10.5, 13, and 11.5 grams. Write one average equation and determine the unknown observation or common group average. _____ Bank label: _____	A quantitative relationship is described by these labeled values: An account balance becomes \$270 after an 8% increase. Identify which quantity the rate is applied to, construct the equation, and solve for the base. _____ Bank label: _____
Five batches average 12.4 liters and three batches average x liters. The combined eight-batch average is 13 liters. Translate the mean into a total for the stated count, then solve for the missing contribution. _____ Bank label: _____	A price is reduced 20% and then increased 25% of the reduced price; the final price is \$100. Let x denote the correct reference base. Write and solve an equation that keeps the percent tied to that base. _____ Bank label: _____

Algebra 1

Writing Linear Equations from Word Problems

Name: _____ Date: _____ Class: _____

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

Equation: $5x + 2(x - 4) = 62$. Required interpretation: x and $x - 4$ are positive measured lengths. Construct and solve a real situation matching the complete equation, making the fixed term, rate, and total explicit. 	A quantitative relationship is described by these labeled values: Six route counts average 7. Five counts are 3, 5, 8, 11, and 9. Translate the mean into a total for the stated count, then solve for the missing contribution.
Two teams have 91 volunteers; the smaller team has 13 fewer than the larger team. Write a single equation that preserves the stated part relationship. Find every part, not only the reference value. 	Equation: $0.75p = 48$. Required interpretation: p is an original price in dollars. Construct and solve a real situation matching the complete equation, making the fixed term, rate, and total explicit.
A48-kilogram alloy order uses materials costing \$30 or \$18 per kilogram for \$1,080. Let x be kilograms of the \$30 material. Build a one-variable conservation model for the two unequal contributions. Determine the amount named by x. 	A quantitative relationship is described by these labeled values: Two angles forming a line are labeled $7x - 12$ degrees and $2x + 3$ degrees. Construct the additive constraint represented here; solve and check that the component measures form the stated whole.

Algebra 1

Writing Linear Equations
from Word Problems

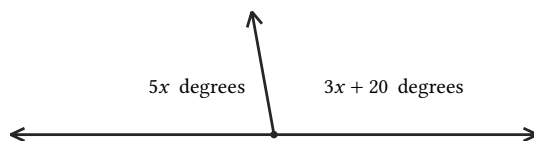
Name: _____ Date: _____ Class: _____

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

A student copies the numerical values into an equation in the order they appear without defining the unknown or checking units. Diagnose the specific reasoning error, then complete the original task: A data table summarizes the quantities as follows: Two reservoirs each start at 15 liters and both drain 2 liters per minute. Construct the equality and decide whether the descriptions match once, never, or for every admissible input. State the relevant domain.

Reservoir	Initial volume (L)	Drain rate (L/min)
A	15	2
B	15	2

A student treats every stated measure as an independent addend and ignores the geometric relationship. Diagnose the specific reasoning error, then complete the original task: A labeled diagram gives this information: A straight angle is divided into parts measuring $5x$ degrees and $3x + 20$ degrees. Translate the labeled parts into the appropriate perimeter or angle relation and solve for the shared variable.



Writing Linear Equations from Word Problems

Full Worked Solutions - excerpt

Worked example

Problem. A quantitative relationship is described by these labeled values: A 25-liter blend uses 80% and 30% solutions and contains 12.5 liters of active ingredient. Let x be liters of the 80% solution. Account for both component weights without treating their counts as independent; then solve and check the total.

Answer. 10 liters of the 80% solution

Explanation and check.

Because the combined quantity is fixed, the second component is the total minus x . Weighting both parts gives $0.80x + 0.30(25 - x) = 12.5$. Solving yields $x = 10$ liters of 80% solution; the complementary amount and both weighted contributions reproduce the given total.

Worked example

Problem. A quantitative relationship is described by these labeled values: A 12-kilogram mixture uses powders labeled 0.06 g/g and 20 g/kg and contains 400 g of active material. Let x be kilograms of the first powder. First reconcile the concentration units, then use the fixed total to write and solve one equation for x .

Answer. 4 kilograms of the first powder

Explanation and check.

Put both concentrations in units compatible with the chosen component amount: $0.06 \text{ g/g} = 60 \text{ g/kg}$. The conserved mixture then gives $60x + 20(12 - x) = 400$, so $x = 4$ kilograms of first powder. The complementary amount makes the active-material total check.

Algebra 1
Checking Linear Models and Contextual Solutions

Checking Linear Models and Contextual Solutions | A1-U02-P12

96 problems · Four activity formats

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

Topic focus
Across 96 tasks this topic asks for justified interpretation.
8 PDFs and a README; 49 buyer pages.

Algebra 1

Checking Linear Models and Contextual Solutions

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 table lists a \$12 entry fee and \$0.45 per mile for m miles. A student proposes $\frac{C}{m} = 12 + 0.45$. Use the units to decide whether this is a total-cost model and state the correct equation. _____ Bank label: _____	For n equally spaced fence posts, a supplied formula gives spacing $r = \frac{360}{n-1}$ feet. The site permits at most 31 posts. Determine n's full contextual domain. _____ Bank label: _____
A 30-item split defines category counts x and $30-x$. One summary says A exceeds B by 8; another says B exceeds A by 4. Classify the information. _____ Bank label: _____	Solving $3.75b + 9 = 54$ gives $b = 12$ bottles. Orders must contain complete cartons of 8 bottles. Is 12 a feasible order size? _____ Bank label: _____
A student proposes 23 and 24 for two consecutive integers whose sum is 47. Verify both 'consecutive' and the sum. _____ Bank label: _____	A calculation shows 58 items needed, 9 per pack, and $\frac{58}{9} = 6.444\dots$. A student chooses 6 packs by nearest-number rounding. Audit the decision and quantify the shortage or surplus after repair. _____ Bank label: _____
On a 180-km route, one equation returns $x = 68$ for distance traveled and another returns $r = 112$ for distance remaining. Determine whether they conflict. _____ Bank label: _____	A map table gives 7.5 cm and a scale of 4 km per map centimeter. Someone writes $d = \frac{7.5}{4}$ km. Use unit cancellation to choose the correct operation and distance. _____ Bank label: _____

Algebra 1

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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: Report 3.7 meters. A transit card balance follows $B = 85 - 6.40r$, where r counts rides and the rider cannot spend beyond the initial balance. Give the feasible domain for r. Your response: _____	Incoming: r is an integer with $0 \leq r \leq 13$. During a ten-dose treatment, d records how many doses a patient has completed, including observations before the first and after the last dose. List the domain. Your response: _____
Incoming: No. The feasible values are 4, 5, 6, and 7. A supplied equation gives cable length $x = 3.746$ meters. The measurement is to be reported to the nearest tenth of a meter. What should be reported? Your response: _____	Incoming: Display $83.5 \frac{km}{h}$. A temperature equation is valid only from 6:30<i>a.m.</i> through 3:00<i>p.m.</i> Let t measure hours since 6:30<i>a.m.</i> Translate the clock-time window into a domain for t. Your response: _____
Incoming: Report approximately 121 square centimeters. A theater sold 260 tickets in all. Let a be the number of adult tickets. State the contextual domain for a without using any price information. Your response: _____	Incoming: $-120 \leq h \leq 450$. For the supplied revenue equation $7s + 4(36 - s) = 198$, s counts \$7 seats and $36 - s$ counts \$4 seats. Identify every domain restriction imposed by those two counts. Your response: _____

Algebra 1

Checking Linear Models and Contextual Solutions

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 calculation $d = 48(2.5) = 120$ is numerically correct but reports '120 hours.' Diagnose and correct the answer unit.

A pump runs at 1.8 liters per minute for 50 seconds. A technician records 90 liters. Audit the time unit and calculate the volume.

A solution to the exact equation $5n = 38$ says, 'n=7.6', so the answer is 8 boxes.' Diagnose the final step.

A \$120 service receives a 7.5% fee. A calculation uses $F = 120 + 7.5(120)$. Identify the interpretation error and find F .

Checking Linear Models and Contextual Solutions

Full Worked Solutions - excerpt

Worked example

Problem. A table lists a \$ 12 entry fee and \$ 0.45 per mile for m miles. A student proposes $\frac{C}{m} = 12 + 0.45$. Use the units to decide whether this is a total-cost model and state the correct equation.

Answer. The proposal mixes dollars per mile with dollars; total cost is $C = 12 + 0.45m$ dollars.

Explanation and check.

Dividing total C by m changes its unit to dollars per mile, while the right side adds a dollar amount to a rate. Keeping the fixed total and multiplying the rate by miles gives compatible dollar terms.

Worked example

Problem. For n equally spaced fence posts, a supplied formula gives spacing $r = \frac{360}{n-1}$ feet. The site permits at most 31 posts. Determine n 's full contextual domain.

Answer. n is an integer with $2 \leq n \leq 31$.

Explanation and check.

A post count is integral. At least two posts are needed to create a spacing, which also keeps $n - 1$ nonzero; the site supplies the upper bound 31.