

Algebra 1
Algebra Foundations to Linear Equations | Algebra 1 | 15-Topic Bundle

15-topic bundle | 1,440 problems | Four activity formats

Included topics

The following pages list all 15 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.

120 PDFs and 15 READMEs; 820 buyer PDF pages across the 15 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

15-topic bundle | 1,440 problems | Four activity formats

01 Classifying Real Numbers

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

02 Ordering and Estimating Real Numbers

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

03 Signed Rational Number Operations

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

04 Mixed Operations with Rational Numbers

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

05 Order of Operations with Grouping Symbols

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

06 Units, Conversions, and Defining Quantities

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

07 Reading and Translating Algebraic Expressions

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

08 Expression Evaluation and Properties of Operations

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

09 Distributive Property and Combining Like Terms

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

10 Equality and One-Step Additive Equations

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

11 One-Step Multiplication and Division Equations

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

15 included resources | Complete resource previews follow this guide.

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Sets & Steps

Math Practice & Worked Solutions

Algebra 1

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12 Two-Step Equations

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

13 Equations with the Distributive Property

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

14 Equations with Like Terms

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

15 Linear Equations: Solving, Coefficients & Reasoning

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

15 included resources | Complete resource previews follow this guide.

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Algebra 1
Classifying Real Numbers

Classifying Real Numbers | A1-U01-P01

96 problems · Four activity formats

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

Topic focus
Across 96 tasks this topic asks for classification with justification.
8 PDFs and a README; 48 buyer pages.

Algebra 1

Classifying Real Numbers

Name: _____ Date: _____ Class: _____

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

Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $\sqrt{11}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R. _____ Bank label: _____	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $(2 - \sqrt{5})(2 + \sqrt{5})$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R. _____ Bank label: _____
Determine whether the number is rational, irrational, or not determined by the evidence. Justify your decision: 1.08333...; after 08, the digit 3 repeats forever. _____ Bank label: _____	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $\frac{0.125}{0.5}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R. _____ Bank label: _____
Determine whether the number is rational, irrational, or not determined by the evidence. Justify your decision: $0.d_1d_2d_3\dots$ where $d_n = 3$ when n is a power of 2 and 0 otherwise. _____ Bank label: _____	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $\frac{\sqrt{12}}{\sqrt{3}}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R. _____ Bank label: _____
Determine whether the number is rational, irrational, or not determined by the evidence. Justify your decision: 0.314159...; only these six digits are supplied and no continuation rule is given. _____ Bank label: _____	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $\sqrt{0}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R. _____ Bank label: _____

Algebra 1

Classifying Real Numbers

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 gives this classification argument: (1) $\sqrt{36}$ contains a radical sign. (2) Every radical is irrational. (3) Therefore $\sqrt{36}$ is irrational. Identify the first invalid claim and repair it, or state that the argument is correct.

A student gives this classification argument: (1) 0.333... repeats forever. (2) A nonterminating decimal is irrational. (3) Therefore 0.333... is irrational. Identify the first invalid claim and repair it, or state that the argument is correct.

A student gives this classification argument: (1) $\frac{7}{2}$ is a ratio of integers. (2) Its denominator is nonzero. (3) Therefore it is rational but not an integer. Identify the first invalid claim and repair it, or state that the argument is correct.

A student gives this classification argument: (1) If x is irrational, then x is real. (2) If x is real, then x is irrational. (3) Thus every real number is irrational. Identify the first invalid claim and repair it, or state that the argument is correct.

Classifying Real Numbers

Full Worked Solutions - excerpt

Worked example

Problem. Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $\sqrt{11}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q , and R .

Answer. irrational; also R

Explanation and check.

Eleven is not a perfect square, so $\sqrt{11}$ is irrational and real.

Worked example

Problem. Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $(2 - \sqrt{5})(2 + \sqrt{5})$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q , and R .

Answer. Z ; also Q, R

Explanation and check.

The conjugate product is

$$4 - 5 = -1$$

an integer.

Algebra 1
Ordering and Estimating Real Numbers

Ordering and Estimating Real Numbers | A1-U01-P02

96 problems · Four activity formats

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

Topic focus
Across 96 tasks this topic asks for allowed integer radicands, allowed integer radicands; justified checking-strategy choice, allowed real radicands, exact consecutive-integer bounds, justified strategy choice, relation symbol and exact justification and least-to-greatest list.
8 PDFs and a README; 53 buyer pages.

Algebra 1

Ordering and Estimating Real Numbers

Name: _____ Date: _____ Class: _____

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

Use the trial-square table to estimate $\sqrt{17}$ to the nearest tenth. Explain how the midpoint row determines the rounding direction. Table: $4.1^2 = 16.81$; $4.15^2 = 17.2225$; $4.2^2 = 17.64$.

Trial	Exact square
4.1	16.81
4.15	17.2225
4.2	17.64

Bank label: _____

Order these exact rational numbers from least to greatest. Use an equals sign for any tie: $-\frac{23}{41}$, -1.5 , 0 , $\frac{39}{24}$.

Bank label: _____

Order these exact real numbers from least to greatest, showing equality if needed: $-\sqrt{39}$, -3 , 0 , $\sqrt{10}$. Use exact integer bounds and squared comparisons to justify the radical placements.

Bank label: _____

Order these exact real numbers from least to greatest, showing equality if needed: $-\sqrt{8}$, -2.8 , $\sqrt{4}$, 2 . Use exact integer bounds and squared comparisons to justify the radical placements.

Bank label: _____

Algebra 1

Ordering and Estimating Real Numbers

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.

Assume n is a nonnegative integer and $\frac{3}{2} < \sqrt{n} \leq 4$. Determine every possible value of n, preserving the endpoint conditions exactly. _____ _____	Assume n is a nonnegative integer and $1 < \sqrt{n} \leq \frac{7}{2}$. Determine every possible value of n, preserving the endpoint conditions exactly. _____ _____
Assume n is a nonnegative integer and $\frac{3}{2} \leq \sqrt{n} < \frac{9}{2}$. Determine every possible value of n, preserving the endpoint conditions exactly. _____ _____	Assume n is a nonnegative integer and $\frac{5}{2} \leq \sqrt{n} \leq \frac{9}{2}$. Determine every possible value of n, preserving the endpoint conditions exactly. _____ _____
Assume n is a nonnegative real number and $\frac{3}{2} \leq \sqrt{n} < 3$. Determine every possible value of n, preserving the endpoint conditions exactly. _____ _____	Without rounding either number, insert $<$, $>$, or $=$ between $\sqrt{11}$ and $\frac{10}{3}$. Justify the comparison using signs and exact squares. _____ _____

Algebra 1

Ordering and Estimating Real Numbers

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: $-\sqrt{41} < -\frac{3}{2} < \sqrt{12} < 6.4$ Order these exact real numbers from least to greatest, showing equality if needed: $-\sqrt{20}$, -4.5, $\sqrt{4}$, 2. Use exact integer bounds and squared comparisons to justify the radical placements. Your response: _____	Incoming: $-4.5 < -\sqrt{20} < \sqrt{4} = 2$ Order these exact real numbers from least to greatest, showing equality if needed: $-\sqrt{24}$, $\sqrt{34}$, 4.8, $-\frac{4}{2}$. Use exact integer bounds and squared comparisons to justify the radical placements. Your response: _____
Incoming: $4 < n \leq 9$ Order these exact real numbers from least to greatest, showing equality if needed: $-\sqrt{41}$, $\sqrt{12}$, 6.4, $-\frac{3}{2}$. Use exact integer bounds and squared comparisons to justify the radical placements. Your response: _____	Incoming: $-\sqrt{5} < -\frac{7}{5} < 0 < \sqrt{15}$ Order these exact real numbers from least to greatest, showing equality if needed: $-\sqrt{37}$, -6.1, $\sqrt{4}$, 2. Use exact integer bounds and squared comparisons to justify the radical placements. Your response: _____
Incoming: $n \in \{5, 6, 7, 8, 9, 10, 11, 12\}$ Assume n is a nonnegative real number and $\frac{5}{2} \leq \sqrt{n} < \frac{9}{2}$. Determine every possible value of n, preserving the endpoint conditions exactly. Your response: _____	Incoming: $-1.1 < -\frac{19}{33} < 0 < \frac{31}{20}$ Order these exact rational numbers from least to greatest. Use an equals sign for any tie: $-\frac{37}{19}$, -0.3, $\frac{5}{4}$, 1.25. Your response: _____

Algebra 1

Ordering and Estimating Real Numbers

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.

Evaluate this reasoning: From $3 < \sqrt{10} < 4$, a student reports $\sqrt{10} = 3.2$ to the nearest tenth. State whether the conclusion and evidence are valid, then repair the justification with exact comparisons.

Evaluate this reasoning: A calculator shows $\sqrt{2}$ as 1.41, so a student concludes $\sqrt{2} = 1.41$ exactly. State whether the conclusion and evidence are valid, then repair the justification with exact comparisons.

Evaluate this reasoning: A student says $\sqrt{20}$ is halfway between $\sqrt{16}$ and $\sqrt{25}$, so $\sqrt{20} = 4.5$. State whether the conclusion and evidence are valid, then repair the justification with exact comparisons.

Evaluate this reasoning: A student writes $-\sqrt{12} > -3$ because $\sqrt{12} > 3$. State whether the conclusion and evidence are valid, then repair the justification with exact comparisons.

Ordering and Estimating Real Numbers

Full Worked Solutions - excerpt

Worked example

Problem. Use the trial-square table to estimate $\sqrt{17}$ to the nearest tenth. Explain how the midpoint row determines the rounding direction. Table: $4.1^2 = 16.81$; $4.15^2 = 17.2225$; $4.2^2 = 17.64$.

Trial	Exact square
4.1	16.81
4.15	17.2225
4.2	17.64

Answer. $\sqrt{17} \approx 4.1$

Explanation and check.

The table brackets the root between 4.1 and 4.2. Since 17 is below the midpoint square 17.2225, round to 4.1.

Worked example

Problem. Order these exact rational numbers from least to greatest. Use an equals sign for any tie: $-\frac{23}{41}$, -1.5 , 0 , $\frac{39}{24}$.

Answer. $-1.5 < -\frac{23}{41} < 0 < \frac{39}{24}$

Explanation and check.

Writing the values as exact fractions gives the order $-1.5 < -\frac{23}{41} < 0 < \frac{39}{24}$.

Algebra 1
Signed Rational Number Operations

Adding and Subtracting Rational Numbers | A1-U01-COMB-P03-P04

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
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Topic focus
Across 96 tasks this topic asks for addition-of-the-opposite rewrite and exact value, exact sum, exact sum with sign explanation, exact total or unit rate with units, exact value and efficient grouping and exact value with grouping-preserving rewrite.
8 PDFs and a README; 59 buyer pages.

Algebra 1

Signed Rational
Number Operations

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.

Rewrite $\frac{23}{4} - (-3)$ as addition of the opposite, then compute its exact value. _____ Bank label: _____	Evaluate $-\frac{5}{3} + \frac{9}{4} + (-\frac{3}{2}) + \frac{5}{3}$. Show an efficient regrouping that uses cancellation or compatible denominators. _____ Bank label: _____
Compute the exact sum $\frac{2}{5} + \frac{3}{5}$. Show how the common sign and magnitudes determine the result. _____ Bank label: _____	Compute the exact sum $0.6 + 0.5$. Show how the common sign and magnitudes determine the result. _____ Bank label: _____
Compute the exact sum $\frac{2}{3} + \frac{7}{9}$. Show how the common sign and magnitudes determine the result. _____ Bank label: _____	Compute $\frac{5}{3} + (-\frac{5}{3})$. Compare the two magnitudes to justify the sign of the sum. _____ Bank label: _____
Compute the exact sum $-4 + (-\frac{5}{7})$. Show how the common sign and magnitudes determine the result. _____ Bank label: _____	Rewrite $\frac{25}{6} - \frac{5}{4}$ as addition of the opposite, then compute its exact value. _____ Bank label: _____

Algebra 1

Signed Rational
Number Operations

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.

Evaluate $\frac{7}{5} + (-\frac{7}{5}) + \frac{1}{3} + \frac{2}{3}$. Show an efficient regrouping that uses cancellation or compatible denominators. _____ _____	Evaluate $\frac{3}{5} + (-\frac{3}{5}) + \frac{7}{2} + (-\frac{7}{2})$. Show an efficient regrouping that uses cancellation or compatible denominators. _____ _____
Evaluate $\frac{8}{3} + (-\frac{8}{3}) + 1 + \frac{2}{3}$. Show an efficient regrouping that uses cancellation or compatible denominators. _____ _____	Evaluate $\frac{7}{2} + (-\frac{7}{2}) + 1 + (-1)$. Show an efficient regrouping that uses cancellation or compatible denominators. _____ _____
Evaluate $-\frac{6}{5} + 1 + (-\frac{3}{2}) + \frac{6}{5}$. Show an efficient regrouping that uses cancellation or compatible denominators. _____ _____	Evaluate $-1 + \frac{3}{4} + (-\frac{3}{4}) + 1$. Show an efficient regrouping that uses cancellation or compatible denominators. _____ _____

Algebra 1

Signed Rational
Number Operations

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: $-8 - (-4) = -4$ USD

Complete the arithmetic blank, or describe all values in the stated domain that work: $\frac{5}{2} \div \underline{\hspace{1cm}} = -\frac{25}{16}$. Enforce the nonzero-divisor restriction. Explain whether the answer is unique.

Your response: _____

Incoming: missing divisor = $-\frac{8}{5}$

Compute $2 \div (-\frac{6}{7})$. Rewrite the quotient by inverting only the nonzero divisor, then simplify.

Your response: _____

Incoming: $-1 + 5 + 3 = 7$ USD

For account balance relative to zero, positive values are above the stated reference and negative values are below it. The initial value is -4 USD, followed by changes of -1 USD and -3 USD, giving final value -8 USD. Find the signed difference final minus initial; write a signed expression and interpret the result.

account balance relative to zero USD

state	value
initial	-4
first change	-1
second change	-3
final	-8

Your response: _____

Incoming: $-\frac{22}{5}$

Compute $-4 \cdot \frac{9}{5}$. Convert any mixed number or decimal to a fraction, cancel whole factors when possible, and apply the sign.

Your response: _____

Algebra 1

**Signed Rational
Number Operations**

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.

Evaluate this signed-number method: Temperatures are -3°C and 5°C , so a student says their directed difference $5 - (-3)$ is -8°C . Identify the first invalid step if there is one, repair the calculation, and verify the result exactly.

Evaluate this signed-number method: A student computes $0 - (-\frac{9}{4}) = -\frac{9}{4}$ because the zero contributes no sign. Identify the first invalid step if there is one, repair the calculation, and verify the result exactly.

Evaluate this signed-number method: To check $-4 + 9 = 5$, a student subtracts 9 from 5 and obtains -4 . Identify the first invalid step if there is one, repair the calculation, and verify the result exactly.

Signed Rational Number Operations

Full Worked Solutions - excerpt

Worked example

Problem. Evaluate this method: A student says $\frac{4}{5} \div 0 = 0$ because zero makes an answer zero. Identify the first invalid step if any and repair the reasoning exactly.

Answer. incorrect

Explanation and check.

Division by zero is undefined; the zero-factor rule applies to multiplication, not a zero divisor.

Worked example

Problem. Evaluate this method: A student says a product of three negative nonzero factors is positive. Identify the first invalid step if any and repair the reasoning exactly.

Answer. incorrect

Explanation and check.

Three is odd, so the product of three negative nonzero factors is negative.

Algebra 1
Mixed Operations with Rational Numbers

Mixed Operations with Rational Numbers | A1-U01-P05

96 problems · Four activity formats

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Topic focus
Across 96 tasks this topic asks for efficient exact representation and value, exact rational value, first invalid step and repaired exact result, missing stage and forward verification, mixed expression and exact quantity with units and supported or not supported with decisive bound.
8 PDFs and a README; 58 buyer pages.

Algebra 1

Mixed Operations with Rational Numbers

Name: _____ Date: _____ Class: _____

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

Use the fully labeled operation diagram. A2-arrow operation machine starts with an unknown value, multiplies by $(-\frac{1}{2})$, then adds $\frac{3}{4}$, and ends at $-\frac{23}{28}$. Recover the starting value by undoing the arrows in reverse order, then verify it forward.

_____	Multiply by $-\frac{1}{2} \rightarrow$	_____	Add $\frac{3}{4} \rightarrow$	$-\frac{23}{28}$
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Bank label: _____

Evaluate $\frac{6}{5}(-3) - \frac{8}{3}$ exactly. Complete the multiplication or division before the addition or subtraction, and show the common-denominator step if one is needed.

Bank label: _____

Use the fully labeled operation diagram. A2-arrow operation machine starts with an unknown value, multiplies by $(-\frac{3}{4})$, then adds $(-\frac{3}{4})$, and ends at $-\frac{33}{28}$. Recover the starting value by undoing the arrows in reverse order, then verify it forward.

_____	Multiply by $-\frac{3}{4} \rightarrow$	_____	Add $-\frac{3}{4} \rightarrow$	$-\frac{33}{28}$
-------	---	-------	--------------------------------	------------------

Bank label: _____

Evaluate $\frac{5}{4} - \frac{10}{3} \div \frac{5}{2}$ exactly. Complete the multiplication or division before the addition or subtraction, and show the common-denominator step if one is needed.

Bank label: _____

Algebra 1

Mixed Operations with Rational Numbers

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.

Start at $\frac{6}{5}$ and follow the fixed order: divide by 5, then add one negative rational number. Construct the adjustment that reaches $-\frac{14}{25}$, and verify that the final result is noninteger. 	Evaluate $\frac{5}{6} - (-0.5) \cdot 1$ exactly. Choose fraction or terminating-decimal form to reduce the work, state why your choice avoids rounding, and give the exact value. 												
Use the quantities in the table. A position changes at a constant signed rate of 6 meters per hour for 2 hours, then has an additional signed change of $\frac{5}{2}$ meters. Write the mixed expression and find the net change in meters. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="text-align: left;">Quantity</th> <th style="text-align: left;">Value</th> <th style="text-align: left;">Unit</th> </tr> </thead> <tbody> <tr> <td>signed rate</td> <td>6</td> <td>meters per hour</td> </tr> <tr> <td>time</td> <td>2</td> <td>hours</td> </tr> <tr> <td>later adjustment</td> <td>$\frac{5}{2}$</td> <td>meters</td> </tr> </tbody> </table> 	Quantity	Value	Unit	signed rate	6	meters per hour	time	2	hours	later adjustment	$\frac{5}{2}$	meters	Evaluate $1.25 \div (-\frac{7}{10}) - 2$ exactly. Choose fraction or terminating-decimal form to reduce the work, state why your choice avoids rounding, and give the exact value.
Quantity	Value	Unit											
signed rate	6	meters per hour											
time	2	hours											
later adjustment	$\frac{5}{2}$	meters											
Evaluate $0.25 + \frac{4}{9} \cdot 3$ exactly. Choose fraction or terminating-decimal form to reduce the work, state why your choice avoids rounding, and give the exact value. 	Evaluate $1.2 + \frac{2}{7} \cdot \frac{1}{2}$ exactly. Choose fraction or terminating-decimal form to reduce the work, state why your choice avoids rounding, and give the exact value. 												

Algebra 1

Mixed Operations with Rational Numbers

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: add $(-\frac{1}{3})$: $\frac{8}{3} \rightarrow 4 \rightarrow \frac{11}{3}$ A2-arrow operation machine starts with an unknown value, divides by $\frac{3}{2}$, then subtracts $\frac{2}{3}$, and ends at $-\frac{20}{21}$. Recover the starting value by undoing the arrows in reverse order, then verify it forward. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 20%; height: 30px; vertical-align: middle;">_____</td> <td style="width: 20%; text-align: center; vertical-align: middle;">Divide by $\frac{3}{2} \rightarrow$</td> <td style="width: 20%; height: 30px; vertical-align: middle;">_____</td> <td style="width: 20%; text-align: center; vertical-align: middle;">Subtract $\frac{2}{3} \rightarrow$</td> <td style="width: 20%; text-align: center; vertical-align: middle;">$-\frac{20}{21}$</td> </tr> </table> Your response: _____	_____	Divide by $\frac{3}{2} \rightarrow$	_____	Subtract $\frac{2}{3} \rightarrow$	$-\frac{20}{21}$	Incoming: $-\frac{3}{7}$ Evaluate $\frac{7}{6} + \frac{1}{5} \cdot 2$ exactly. Complete the multiplication or division before the addition or subtraction, and show the common-denominator step if one is needed. Your response: _____
_____	Divide by $\frac{3}{2} \rightarrow$	_____	Subtract $\frac{2}{3} \rightarrow$	$-\frac{20}{21}$		
Incoming: $\frac{3}{10}$ Start at $\frac{8}{3}$ and follow the fixed order: divide by $\frac{2}{3}$, then add one negative rational number. Construct the adjustment that reaches $\frac{11}{3}$, and verify that the final result is noninteger. Your response: _____	Incoming: $\frac{9}{2}$ Evaluate $-\frac{7}{5} - \frac{5}{2} \div \frac{5}{2}$ exactly. Complete the multiplication or division before the addition or subtraction, and show the common-denominator step if one is needed. Your response: _____					
Incoming: $-\frac{493}{24}$ A2-arrow operation machine starts with an unknown value, adds $(-\frac{2}{3})$, then multiplies by 6, and ends at $\frac{38}{7}$. Recover the starting value by undoing the arrows in reverse order, then verify it forward. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 20%; height: 30px; vertical-align: middle;">_____</td> <td style="width: 20%; text-align: center; vertical-align: middle;">Add $-\frac{2}{3} \rightarrow$</td> <td style="width: 20%; height: 30px; vertical-align: middle;">_____</td> <td style="width: 20%; text-align: center; vertical-align: middle;">Multiply by $6 \rightarrow$</td> <td style="width: 20%; text-align: center; vertical-align: middle;">$\frac{38}{7}$</td> </tr> </table> Your response: _____	_____	Add $-\frac{2}{3} \rightarrow$	_____	Multiply by $6 \rightarrow$	$\frac{38}{7}$	Incoming: $\frac{71}{10}$ Evaluate $\frac{3}{4} - \frac{1}{2} \div 2$ exactly. Complete the multiplication or division before the addition or subtraction, and show the common-denominator step if one is needed. Your response: _____
_____	Add $-\frac{2}{3} \rightarrow$	_____	Multiply by $6 \rightarrow$	$\frac{38}{7}$		

Algebra 1

Mixed Operations with Rational Numbers

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 worked calculation for $\frac{3}{4} + (\frac{2}{5})(\frac{5}{2})$. Step 1: Add $\frac{3}{4} + \frac{2}{5}$ first. Step 2: Multiply that result by $\frac{5}{2}$. Identify the first invalid step, preserve every valid prefix, and give the repaired exact result. If no step is invalid, say so.

Audit this worked calculation for $\frac{2}{5} + (\frac{1}{3})(\frac{3}{4})$. Step 1: Multiply $\frac{1}{3}$ by $\frac{3}{4}$ to get $\frac{1}{4}$. Step 2: Add $\frac{2}{5} + \frac{1}{4}$ as $\frac{3}{9} = \frac{1}{3}$. Identify the first invalid step, preserve every valid prefix, and give the repaired exact result. If no step is invalid, say so.

Audit this worked calculation for $\frac{3}{4} \div (\frac{5}{6}) - \frac{1}{10}$. Step 1: Rewrite as $\frac{3}{4}$ times $\frac{5}{6}$ minus $\frac{1}{10}$. Step 2: Report $\frac{21}{40}$. Identify the first invalid step, preserve every valid prefix, and give the repaired exact result. If no step is invalid, say so.

Audit this worked calculation for $(\frac{3}{4} + \frac{5}{6})(\frac{2}{3})$. Step 1: Cancel the 3 in $\frac{3}{4}$ with the outside factor $\frac{2}{3}$. Step 2: Multiply the remaining expression. Identify the first invalid step, preserve every valid prefix, and give the repaired exact result. If no step is invalid, say so.

Mixed Operations with Rational Numbers

Full Worked Solutions - excerpt

Worked example

Problem. Start at $\frac{7}{3}$. Use each operation exactly once—add $\frac{8}{3}$ and multiply by $\frac{3}{4}$ —in an order that reaches $\frac{15}{4}$. The intermediate value must be positive. Construct and verify the chain.

Answer. $\frac{7}{3} \rightarrow$ add $\frac{8}{3} \rightarrow 5 \rightarrow$ multiply by $\frac{3}{4} \rightarrow \frac{15}{4}$

Explanation and check.

Adding first gives the required positive intermediate 5; multiplying it by $\frac{3}{4}$ reaches $\frac{15}{4}$.

Worked example

Problem. Start at $\frac{3}{2}$. Use each operation exactly once—add $\frac{4}{3}$ and multiply by $\frac{3}{2}$ —in an order that reaches $\frac{17}{4}$. The intermediate value must be positive. Construct and verify the chain.

Answer. $\frac{3}{2} \rightarrow$ add $\frac{4}{3} \rightarrow \frac{17}{6} \rightarrow$ multiply by $\frac{3}{2} \rightarrow \frac{17}{4}$

Explanation and check.

Adding first gives the required positive intermediate $\frac{17}{6}$; multiplying it by $\frac{3}{2}$ reaches $\frac{17}{4}$.

Algebra 1
Order of Operations with Grouping Symbols

Order of Operations with Grouping Symbols | A1-U01-P06

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 valid groupings or impossibility proof, all valid groupings or impossibility proof; justified strategy selection, equivalent expression or tree and exact value, equivalent expression or tree and exact value; justified strategy selection, exact value or undefined verdict and exact value or undefined verdict; justified strategy selection.
8 PDFs and a README; 63 buyer pages.

Algebra 1

**Order of Operations
with Grouping Symbols****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.

Evaluate $5 + 7 \cdot 4 - 1$. At each precedence level, work from left to right; show the decisive first operation.

Bank label: _____

Evaluate $3 + 2 \cdot 5 - 1$. At each precedence level, work from left to right; show the decisive first operation.

Bank label: _____

Algebra 1

Order of Operations with Grouping Symbols

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.

Translate $(4 - 3) \div 4$ into an operation tree whose leaves and operation nodes preserve every grouping, and state its exact value. _____ _____	Insert grouping into $4 + 4 - 4 \div 4$ to obtain 4, without reordering operands or operations. Any full parenthesization preserving the displayed order is allowed. Give every valid grouping, or prove none works by checking the permitted structures. _____ _____
Insert grouping into $5 - 4 + 5 \cdot 3$ to obtain $\frac{33}{2}$, without reordering operands or operations. Only these grouping templates are allowed: $(5 - (4 + 5)) \cdot 3$; $5 - (4 + (5 \cdot 3))$; $(5 - 4) + (5 \cdot 3)$. Give every valid grouping, or prove none works by checking the permitted structures. _____ _____	Evaluate $(10 - 6)(2 + 1)$. Record each completed inner group before using it in the enclosing operation. _____ _____
Insert grouping into $2 - 4 + 6 \cdot 2$ to obtain 8, without reordering operands or operations. Any full parenthesization preserving the displayed order is allowed. Give every valid grouping, or prove none works by checking the permitted structures. _____ _____	A fraction bar has numerator $[8 + 1 \cdot 5]$ and denominator $[5 - 5]$. Evaluate each whole group, then evaluate the compound fraction or state that it is undefined. _____ _____

Algebra 1

Order of Operations with Grouping Symbols

Name: _____ Date: _____ Class: _____

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

Compare $(-9)^4$ and -9^4 . Evaluate both, state whether they are equal, and explain how the parentheses and exponent parity control the sign.

Audit the evaluation of $-|4 - 9| + 2$. Step 1: Compute $4 - 9 = -5$. Step 2: Replace $|-5|$ by -5 , so the external negative gives $-(-5)$. Step 3: Add 2 and report 7. Identify the first invalid step, preserve the valid prefix, and give the corrected value. If every step is valid, say so.

Audit the evaluation of $18 \div [7 - (5 - 4)]$. Step 1: Compute $5 - 4 = 1$. Step 2: Compute $7 - 1 = 6$. Step 3: Replace the bracket by 7 and report $\frac{18}{7}$. Identify the first invalid step, preserve the valid prefix, and give the corrected value. If every step is valid, say so.

Compare $(-5)^2$ and -5^2 . Evaluate both, state whether they are equal, and explain how the parentheses and exponent parity control the sign.

Order of Operations with Grouping Symbols

Full Worked Solutions - excerpt

Worked example

Problem. Evaluate $5 + 7 \cdot 4 - 1$. At each precedence level, work from left to right; show the decisive first operation.

Answer. 32

Explanation and check.

First

$$7 \cdot 4 = 28$$

Then move left to right:

$$5 + 28 - 1 = 32$$

Worked example

Problem. Evaluate $3 + 2 \cdot 5 - 1$. At each precedence level, work from left to right; show the decisive first operation.

Answer. 12

Explanation and check.

First

$$2 \cdot 5 = 10$$

Then move left to right:

$$3 + 10 - 1 = 12$$

Algebra 1
Units, Conversions, and Defining Quantities

Operations with Measurements and Unit Conversion | A1-U01-COMB-P07-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 compatibility verdict with dimensional trace, coordinate value with axis units, defect list and repaired definition, definition with datum and sign meanings, equivalent measurement with cancellation and equivalent rate with two unit cancellations.
8 PDFs and a README; 77 buyer pages.

Algebra 1

Units, Conversions, and
Defining Quantities

Name: _____ Date: _____ Class: _____

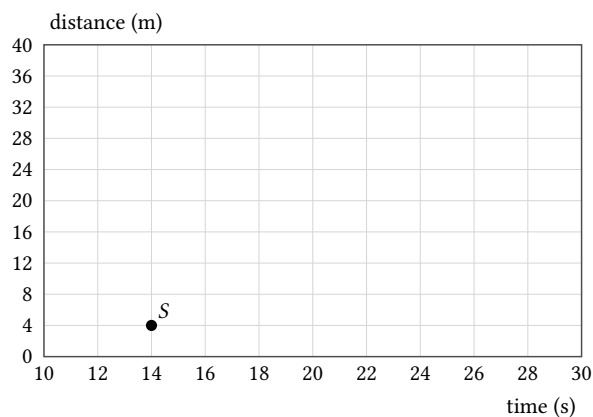
Answer each question and record the matching bank letter. Give exact values. A value without its unit is not a complete answer.

One board is 6 ft 11 in long and another is 14 in long. Find their combined length in inches. Organize all quantities in one consistent unit system before calculating.

Quantity	Value	Unit
first piece feet	6	<i>ft</i>
first piece inches	11	in
second piece	14	in

Bank label: _____

A graph uses an x -axis starting at 10 s with 2 s per tick and a y -axis starting at 0 m with 4 m per tick. Point S is at tick indices (2, 1). Report its coordinate pair with units.



Bank label: _____

Algebra 1

Units, Conversions, and
Defining Quantities

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: 24 in Compare these legitimate variable choices: m = elapsed time in minutes; h = elapsed time in hours. State their relationship ($m = 60h$) and decide which choice is more direct for the stated focus “minutes.” Do not construct or solve a full model. Your response: _____	Incoming: Relationship: $m = 60h$. The m definition answers a question requesting minutes directly. Compare these legitimate variable choices: u = liters used; r = liters remaining from an initial T liters. State their relationship ($r = T - u$) and decide which choice is more direct for the stated focus “remaining.” Do not construct or solve a full model. Your response: _____												
Incoming: 420 min Using 1 ft = 12 in, convert 2 ft to in. Write a ratio equal to 1 so that ft cancels, and check whether the new magnitude is sensible. Your response: _____	Incoming: Let e be the elapsed time from first alarm to all-clear, measured in seconds. A report asks for the distinct customers, not the number of purchases. Define the variable c operationally: name exactly what is counted or measured and include its unit. Clarify its scope so it cannot be confused with a nearby total, rate, object, or reference interval. Your response: _____												
Incoming: kg/m³ Material costs 4 USD/kg. What is the cost of 4 packages of 350 g each? Organize all quantities in one consistent unit system before calculating. <table border="1" data-bbox="154 1486 795 1612"> <thead> <tr> <th>Quantity</th> <th>Value</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>unit price</td> <td>4</td> <td>USD/kg</td> </tr> <tr> <td>mass per package</td> <td>350</td> <td>g</td> </tr> <tr> <td>packages</td> <td>4</td> <td>count</td> </tr> </tbody> </table> Your response: _____	Quantity	Value	Unit	unit price	4	USD/kg	mass per package	350	g	packages	4	count	Incoming: 0.158 m Using 1 lb = 16 oz, convert 21 oz to lb. Write a ratio equal to 1 so that oz cancels, and check whether the new magnitude is sensible. Your response: _____
Quantity	Value	Unit											
unit price	4	USD/kg											
mass per package	350	g											
packages	4	count											

Algebra 1

Units, Conversions, and
Defining Quantities

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 worked solution: $5 \text{ m} \left(\frac{100 \text{ cm}}{1 \text{ m}} \right) \left(\frac{100 \text{ cm}}{1 \text{ m}} \right) = 50000 \text{ cm}$. Identify the first invalid stage, if any, track the units, and give the corrected conclusion.

Choose the strategy that directly produces the required value and units, and justify the unit operations. Choice A: use $\left(\frac{1 \text{ km}}{1000 \text{ m}} \right) (3600 \text{ s}/(1 \text{ hr}))$. Choice B: use $(1 \text{ km}/(1000 \text{ m})) (1 \text{ hr}/(3600 \text{ s}))$. Convert 3 m/s to $\frac{\text{km}}{\text{hr}}$. Use the supplied relations $1 \text{ km} = 1000 \text{ m}$ and $1 \text{ hr} = 3600 \text{ s}$, orienting one ratio for the numerator unit and one for the denominator unit. Show both cancellations. Explain why reversing either factor would leave an unwanted unit or create a reciprocal-rate error.

Audit this worked solution: Because $A = L^2$ has area units, it must be the correct area formula for every shape. Identify the first invalid stage, if any, track the units, and give the corrected conclusion.

Audit this worked solution: Convert 6 m/s to $\frac{\text{km}}{\text{hr}}$: $6 \left(\frac{1 \text{ km}}{1000 \text{ m}} \right) = \frac{3}{500} \text{ km/hr}$. Identify the first invalid stage, if any, track the units, and give the corrected conclusion.

Units, Conversions, and Defining Quantities

Full Worked Solutions - excerpt

Worked example

Problem. Audit this worked solution: An axis starts at 0 and rises by 2.5 per tick; tick 6 is labeled 6. Identify the first invalid stage, if any, track the units, and give the corrected conclusion.

Answer. First invalid stage: axis reading. Correct conclusion: 15 units.

Explanation and check.

Multiply the tick index by 2.5.

Worked example

Problem. Diagnose the proposed definition “Let b be the bicycle.” Identify the missing semantic component or components, then rewrite it as an operational variable definition.

Answer. Missing: quantity measured. Repair: Let b be the distance the bicycle travels, in kilometers.

Explanation and check.

A symbol must represent a measurable attribute, not the physical object.

Algebra 1
Reading and Translating Algebraic Expressions

Reading and Translating Algebraic Expressions | A1-U01-COMB-P09-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 contextual expression with unit rationale, correctly grouped two-stage expression, equivalent-description labels with structural reason, first error and corrected structural labels, first mismatch and repaired expression and marked subexpression role at named level.

8 PDFs and a README; 55 buyer pages.

Algebra 1

Reading and Translating Algebraic Expressions

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 $\frac{7}{x+4} + 1$, treat the marked subexpression “$x + 4$” as one quantity. Describe its role in the whole expression at the requested level “path from marked group to the root” without expanding or evaluating. Compare its immediate role with its role after moving one level outward, and explain why both descriptions can be true. _____ Bank label: _____	Construct one expression satisfying all requirements: outer operation is division; numerator is the two-term sum $-x + 5$; denominator is $2(y + 1)$; the quotient is one outer term. Then audit your expression by listing its outer signed terms. Equivalent answers are allowed; do not simplify by expanding or combining. _____ Bank label: _____
At the outer additive level of $\frac{n+7}{13} - 6y + 2$, list the signed terms in order. Keep every product, quotient, or parenthesized factor intact; do not expand or combine anything. _____ Bank label: _____	At the outer additive level of $-(y - 5) + 9y - 4$, list the signed terms in order. Keep every product, quotient, or parenthesized factor intact; do not expand or combine anything. _____ Bank label: _____

Algebra 1

Reading and Translating Algebraic Expressions

Name: _____ Date: _____ Class: _____

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

The supplied model is $C = F + rn$, with definitions: C : total charge in USD; F : fixed fee in USD; r : usage price in USD/unit; n : number of usage units. Interpret F and rn in context, stating whether each is a separate contribution, a repeated-group factor, or a product and tracking its unit. Use the requested focus “grouped factor.” Do not build or solve the model.

The supplied model is $T = k(a + b)$, with definitions: T : total items; k : number of identical groups; a : red items per group; b : blue items per group. Interpret $a + b$ and k in context, stating whether each is a separate contribution, a repeated-group factor, or a product and tracking its unit. Use the requested focus “selected outer term.” Do not build or solve the model.

The supplied model is $R = S - uq$, with definitions: R : remaining material in meters; S : starting material in meters; u : meters used per piece; q : pieces made. Interpret S and uq in context, stating whether each is a separate contribution, a repeated-group factor, or a product and tracking its unit. Use the requested focus “selected product.” Do not build or solve the model.

Audit the annotation: In $4(x + 2)$, x and 2 are the two outer terms. Identify the first structural labeling error, correct all affected labels, and justify the correction using the relevant operation level.

Reading and Translating Algebraic Expressions

Full Worked Solutions - excerpt

Worked example

Problem. Audit the proposed translation of “three times the sum of x and 2”: $3x + 2$. Identify the first operator or operand-role mismatch and repair the expression while preserving every correct component.

Answer. $3(x + 2)$

Explanation and check.

The whole sum must be one factor.

Worked example

Problem. Audit the proposed translation of “five less than x ”: $5 - x$. Identify the first operator or operand-role mismatch and repair the expression while preserving every correct component.

Answer. $x - 5$

Explanation and check.

Less-than makes x the minuend and 5 the subtrahend.

Algebra 1
Expression Evaluation and Properties of Operations

Expression Evaluation and Properties of Operations | A1-U01-COMB-P11-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 comparison with structural explanation, counterexample and corrected rule, equivalent rewrite, value, and property explanation, exact value, exact value or insufficiency with witnesses and exact value with grouping shown.
8 PDFs and a README; 54 buyer pages.

Algebra 1

Expression Evaluation and Properties of Operations

Name: _____ Date: _____ Class: _____

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

An answer may be used more than once.

Evaluate $x(x - 1) + 2x$ when $x = -5$. Replace every occurrence of x before simplifying.

Evaluate $-(x^3) + 2x$ when $x = -3$. Show the substituted negative input in parentheses so the base of each power is clear.

Bank label: _____

Bank label: _____

Use the given assignments $x = 0, y = 0$ to evaluate $4(x + y) - 3x$. Match every value to its symbol and preserve the grouping.

$$4(x + y) - 3x$$

variable	value
x	0
y	0

Use the given assignments $x = 0, y = 2$ to evaluate $x(y - 3) + 3y$. Match every value to its symbol and preserve the grouping.

$$x(y - 3) + 3y$$

variable	value
x	0
y	2

Bank label: _____

Bank label: _____

Algebra 1

Expression Evaluation and Properties of Operations

Name: _____ Date: _____ Class: _____

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

Use the given assignments $x = -2$, $y = 0$ to evaluate $x(y - 3) + 3y$. Match every value to its symbol and preserve the grouping. _____ _____	Use the given assignments $x = 0$, $y = 0$ to evaluate $x(y - 5) + 5y$. Match every value to its symbol and preserve the grouping. _____ _____
Evaluate $\frac{x+2}{x+7}$ at $x = -2$. Check the denominator in the original expression before simplifying; if it is zero, state why the value is undefined. _____ _____	Evaluate $\frac{x+1}{x-(-2)}$ at $x = -2$. Check the denominator in the original expression before simplifying; if it is zero, state why the value is undefined. _____ _____
Evaluate $\frac{x+3}{x-(0)}$ at $x = 0$. Check the denominator in the original expression before simplifying; if it is zero, state why the value is undefined. _____ _____	Evaluate $\frac{x+5}{x-(1)}$ at $x = 1$. Check the denominator in the original expression before simplifying; if it is zero, state why the value is undefined. _____ _____

Algebra 1

Expression Evaluation and Properties of Operations

Name: _____ Date: _____ Class: _____

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

Choose and justify a method before solving (direct substitution, an organized value table, or an equivalent-form check). Then complete the task: Use the given assignments $x = -2$, $y = -2$ to evaluate $2(x + y) - x$. Match every value to its symbol and preserve the grouping.

$$2(x + y) - x$$

variable	value
x	-2
y	-2

Choose and justify a method before solving (direct substitution, an organized value table, or an equivalent-form check). Then complete the task: Use the given assignments $x = -3$, $y = 3$, $z = 0$ to evaluate $(x + 2y)(z - x)$. Match every value to its symbol and preserve the grouping.

$$(x + 2y)(z - x)$$

variable	value
x	-3
y	3
z	0

Expression Evaluation and Properties of Operations

Full Worked Solutions - excerpt

Worked example

Problem. Evaluate $2x + x - 1$ when $x = -6$. Replace every occurrence of x before simplifying.

Answer. -19

Explanation and check.

Replace both occurrences of x by -6 : $2(-6) + (-6) - 1 = -19$.

Worked example

Problem. Evaluate $3x + x - 3$ when $x = 0$. Replace every occurrence of x before simplifying.

Answer. -3

Explanation and check.

Replace both occurrences of x by 0 : $3(0) + (0) - 3 = -3$.

Algebra 1
Distributive Property and Combining Like Terms

Distributive Property and Combining Like Terms | A1-U01-COMB-P13-P15

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 admissible witness and exact values, coefficient or inconsistency proof, collected expression, decomposition, distributed computation, exact value, equivalent form and verification and expanded and collected form.
8 PDFs and a README; 53 buyer pages.

Algebra 1

Distributive Property and Combining Like Terms

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.

Audit the work " $(\frac{2}{3})(6x - 9) = 4x - 9$." Identify the first missing or invalid factor-term pairing, correct the expansion or factorization, and verify the correction at the simple value stated or at a value you choose.

Bank label: _____

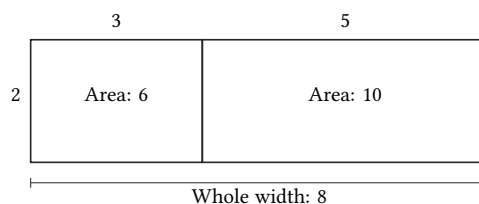
Compute $(25)(12)$ by decomposing one factor into a useful sum or difference and distributing. Show why your chosen decomposition reduces the work.

Bank label: _____

Complete or assess the distributive identity $3(\text{ } x + 2) = 6x + 6$. Recover the missing component by matching corresponding products; if no value works, explain the conflicting requirements.

Bank label: _____

A rectangle has common height 2 and is partitioned into vertical strips with widths 3, 5; the whole width is 8. Use the stated partition incidence to write the total area both as height times whole width and as the sum of strip areas. Explain why the expressions are equal.



Bank label: _____

Algebra 1

Distributive Property and Combining 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. A value without its unit is not a complete answer.

Compute $(2)(22)$ by decomposing one factor into a useful sum or difference and distributing. Show why your chosen decomposition reduces the work. _____ _____	Audit the work "$3(x + 5) = 3x + 5$." Identify the first missing or invalid factor-term pairing, correct the expansion or factorization, and verify the correction at the simple value stated or at a value you choose. _____ _____
Audit the work "$-(x - 4) = -x - 4$." Identify the first missing or invalid factor-term pairing, correct the expansion or factorization, and verify the correction at the simple value stated or at a value you choose. _____ _____	Audit the work "$2(x + 3) + 4(y - 1) = 2x + 6 + 4y - 1$." Identify the first missing or invalid factor-term pairing, correct the expansion or factorization, and verify the correction at the simple value stated or at a value you choose. _____ _____
Audit the work "$-6x + 12 = -6(x + 2)$." Identify the first missing or invalid factor-term pairing, correct the expansion or factorization, and verify the correction at the simple value stated or at a value you choose. _____ _____	Audit the work "$8x + 12 + 4y = 4(2x + 12 + y)$." Identify the first missing or invalid factor-term pairing, correct the expansion or factorization, and verify the correction at the simple value stated or at a value you choose. _____ _____

Algebra 1

Distributive Property and Combining 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 work " $2(a + b - 3) = 2a + b - 6$." Identify the first missing or invalid factor-term pairing, correct the expansion or factorization, and verify the correction at the simple value stated or at a value you choose.

Audit the work " $-4(y + 2) = -4y + 8$." Identify the first missing or invalid factor-term pairing, correct the expansion or factorization, and verify the correction at the simple value stated or at a value you choose.

Audit the work " $6x + 10 = 3(2x + 5)$." Identify the first missing or invalid factor-term pairing, correct the expansion or factorization, and verify the correction at the simple value stated or at a value you choose.

Audit the simplification " $2x + 5x^2 = 7x^2$." Identify the first invalid grouping or state that it is valid, compare complete variable parts, and give the corrected result with a coefficient-based explanation.

Distributive Property and Combining Like Terms

Full Worked Solutions - excerpt

Worked example

Problem. Audit the work “ $(\frac{2}{3})(6x - 9) = 4x - 9$.” Identify the first missing or invalid factor-term pairing, correct the expansion or factorization, and verify the correction at the simple value stated or at a value you choose.

Answer. The scalar $\frac{2}{3}$ was not applied to -9 . Correct: $4x - 6$; at $x = 0$, both correct forms equal -6 .

Explanation and check.

Check every factor-term pairing. The scalar $\frac{2}{3}$ was not applied to -9 . Correct: $4x - 6$; at $x = 0$, both correct forms equal -6 .

Worked example

Problem. Compute $(25)(12)$ by decomposing one factor into a useful sum or difference and distributing. Show why your chosen decomposition reduces the work.

Answer. $25(10 + 2) = 250 + 50 = 300$

Explanation and check.

Use the displayed benchmark split and distribute to get easier partial products:

$$25(10 + 2) = 250 + 50 = 300$$

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: _____

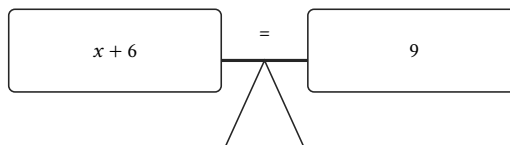
Under the stated domain $[-2, -1, 0, 1, 2]$, compare the complete solution sets of $x = 2$ and $(x - 2)(x + 1) = 0$. Use direct membership or the supplied finite domain rather than visual similarity, then state whether the equations are equivalent.

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
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 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

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 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

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 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: _____

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.

Algebra 1
Equations with Like Terms

Equations with Like Terms | A1-U02-P06

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 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: _____

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: _____

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.