Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Linear Equations with Fractions and Decimals

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

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for both routes, compared intermediate equations, and justification of equal solution sets, common multiplier, fully scaled equation, exact solution, and check, common multiplier, preserved numerator groups, exact solution, and verification, exact root, rounded result, and changed-equation verdict, first error, fully corrected scaled equation, and solution and method choice, structural justification, exact solution, and check.

8 PDFs and a README; 51 buyer pages.

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

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Algebra 1

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Name: _____ **Date:** _____ **Class:** _____

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

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

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Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. Give the whole requested response, including any reasoning the question asks for.

Compare $(\frac{1}{2})x + \frac{3}{4} = (\frac{1}{3})x + \frac{5}{6}$ with $6x + 9 = 4x + 10$. Recover the least positive multiplier that clears every denominator and verify all four terms.	Construct a rational equation that becomes $3x + 5 = x + 13$ when every term is multiplied by 12. Use the resulting denominator set and verify equivalence.
Compare $-(\frac{2}{5})x + \frac{7}{10} = (\frac{3}{4})x - \frac{1}{2}$ with $-8x + 14 = 15x - 10$. Recover the least positive multiplier that clears every denominator and verify all four terms.	A coefficient in $-(\frac{2}{3})x + \frac{1}{2} = (\frac{1}{4})x + \frac{13}{4}$ is replaced by its displayed decimal approximation. Quantify the resulting root change rather than assuming equivalence.
Reverse the nonzero scale -6 on $-2x + 7 = 4x - 8$ to design a rational equation. Preserve signs term by term and prove the solution set is unchanged.	The equation $(\frac{3}{8})x - \frac{5}{6} = (\frac{1}{4})x + \frac{7}{12}$ was scaled to $18x - 40 = 12x + 28$. Recover the common multiplier and decide whether it is least or merely valid.

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Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

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

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Name: _____ **Date:** _____ **Class:** _____

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

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

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

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

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

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Full Worked Solutions - excerpt

Worked example

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

Answer. 4

Explanation and check.

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

Worked example

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

Answer. -3

Explanation and check.

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