

Algebra 1
Multiplication and Division Inequalities

Multiplication and Division Inequalities | A1-U03-P03

96 problems · Four activity formats

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Topic focus
Across 96 tasks this topic asks for allowable scale with identifiability explanation, allowable scale with identifiability explanation; justified method selection, first error and repaired reasoning, reversed comparison with justification, reversed comparison with justification; justified method selection and set relationship with decisive witness.
8 PDFs and a README; 47 buyer pages.

Algebra 1

Multiplication and Division Inequalities

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.

Choose k so $kx > -9$ is equivalent to $x > -6$. _____ Bank label: _____	Determine r so x divided by r at most $\frac{3}{4}$ has boundary $\frac{9}{8}$. _____ Bank label: _____
Determine a so that $ax \leq 18$ produces the target $x \geq -6$. _____ Bank label: _____	Solve $(-\frac{5}{12})x \leq -\frac{35}{18}$ and simplify the exact boundary. _____ Bank label: _____
Determine the x-first solution of $-\frac{5}{2} \geq x$ divided by -3. _____ Bank label: _____	Solve $-7 < -x$ without losing the strict endpoint. _____ Bank label: _____
Solve $-0.06x \geq 0.9$ exactly. _____ Bank label: _____	Find the solution set of $(\frac{13}{6})x \geq 0$. _____ 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.

Starting from $m < n$, scale by -2 and then by -3. Track each reversal and give the final comparison. _____ _____	Find p so $px > \frac{5}{6}$ yields the target $x < -\frac{10}{3}$. _____ _____
Verify $x \leq 6$ as the solution of $18 \geq 3x$. _____ _____	Solve $ax < 6$ for every possible sign of a, including $a = 0$. _____ _____
Isolate x in $8x \leq 8$. _____ _____	What changes when $-3x \leq 12$ is made strict? _____ _____

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

A claimed solution of $-0.25x < 3$ is $x < -0.75$. Diagnose it using the true equality input and simple witnesses.

A student claims multiplying $1 < 3$ by -2 gives $-2 < -6$. Test the claim and repair it.

Use the test values $x = -8$, $x = -9$, and $x = 0$. A proposed answer for $(-\frac{3}{4})x > 6$ is $x > -8$. Use the listed values to audit its direction.

A student starts with $-2x \leq 14$, divides by -2 and reverses to $x \geq -7$, then reverses again because the boundary is negative and writes $x \leq -7$. The work reverses once for a negative divisor and again because the boundary is negative. Locate the first invalid line after the correct step.

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Full Worked Solutions - excerpt

Worked example

Problem. Choose k so $kx > -9$ is equivalent to $x > -6$.

Answer. The scale is $k = \frac{3}{2}$.

Explanation and check.

The direction is preserved, so $k > 0$. Solving $-\frac{9}{k} = -6$ yields $k = \frac{3}{2}$.

Worked example

Problem. Determine r so x divided by r at most $\frac{3}{4}$ has boundary $\frac{9}{8}$.

Answer. The divisor is $r = \frac{3}{2}$.

Explanation and check.

The unchanged orientation requires $r > 0$; $(\frac{3}{4})r = \frac{9}{8}$ gives $r = \frac{3}{2}$.