Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Compound Inequalities

Solving Compound Inequalities | A1-U03-P06

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for compound solution set with connector and endpoint reasoning.

8 PDFs and a README; 48 buyer pages.

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

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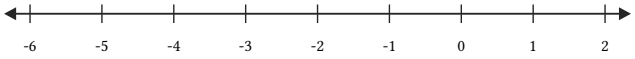
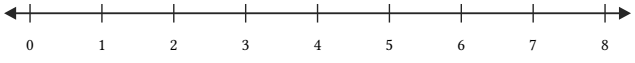
Algebra 1

Compound 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.

Combine the conditions $(\frac{2}{3})x - 1 \geq -3$ AND $(\frac{1}{2})x + 2 < 5$. Find the exact common interval. Bank label: _____	Solve $x \leq 7$ AND $x < 4$. Bank label: _____
A course pass requires a grade of at least 70, unless an approved alternate assessment has been passed. Let A denote alternate passed; let g denote course grade. Model the two passing routes. Bank label: _____	Show the intersection of $x \leq -2$ and $x > -2$.  Bank label: _____
Combine the conditions $(-4 < x \leq 7)$ AND $(-4 \leq x < 6)$. Compute the exact intersection, paying attention at -4. Bank label: _____	Which scheduled hours 0, 2, 4, 6, and 8 satisfy $t < 2$ OR $t > 6$? Bank label: _____
Translate every part of $2 < x - 4 \leq 10$. Bank label: _____	Combine the conditions $(-2x \geq -8)$ OR $(-3x < -12)$. Solve and combine the rays.  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.

The target solution set is (−infinity,-2] union (5,infinity). Both displayed coefficients of x must be negative. Construct the target OR set so each component requires negative division.	Check -5 in the condition $x < -3$ OR $x > 6$.
Determine whether 0 belongs to $x < -4$ OR $x > 4$.	An integer code is accepted if it is nonpositive or at least 8. Let n denote integer code. State the connector, inequalities, and domain.
Test $x = 0$ and $x = 3$ after solving each part of $5 - 2x \geq 1$ OR $3x + 4 > 1$.	Work with $-8 < 3x + 1 \leq 7$. Solve the mixed-endpoint chain.

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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: The interval is $(3, 5]$.

The allowed values are natural numbers 1 through 8. Apply the condition $5n < 10$ OR $2n \geq 12$. Solve the OR condition and list permitted natural numbers in the window.

Your response: _____

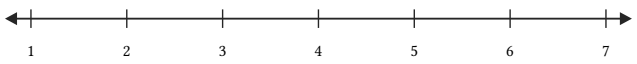
Incoming: The set is $\{1, 6, 7, 8\}$.

Solve $-3 < x + 2 < 5$.

Your response: _____

Incoming: The set is $x < -3$ OR $x \geq 4$.

Combine the conditions $(7 < 2x + 1)$ AND $(5x - 4 \leq 21)$. Solve the oppositely written bounds and graph the result.



Your response: _____

Incoming: The overlap is $[-6, 2)$.

Combine the conditions $((a + 2)x \leq -a - 2)$ OR $(x > 4)$. Given $a > -2$, solve the OR condition.

Your response: _____

Incoming: The set is $\{1, 2, 3, 5, 6, 7\}$.

Rewrite $7 > 2x - 1 \geq -5$ in increasing order and solve.

Your response: _____

Incoming: The interval is $-1 \leq x < 3$.

Solve $-2 < -x \leq 5$ and write the bounds in increasing order.

Your response: _____

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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.

For $x > -5$ OR $x \geq 2$, *a* student keeps only $x \geq 2$, claiming that the stricter bound must be used. Explain why 'stricter' is the wrong union rule.

Admission is free for children under 5 or for members who are at least 65. Let a denote age in years; let m denote membership status. Translate the two eligibility routes without treating age alone as sufficient in the second route. Explicitly select AND or OR (including any nested connector), and justify why that logic matches the stated conditions.

Let A be the condition $x < 0$ and B the condition $x > 0$. Edit B to $x \geq 0$ and compare before and after.

For integer n, let A be the condition $n < 3.5$ and B the condition $n \leq 3$. Compare AND and OR over the stated integer domain.

Compound Inequalities

Full Worked Solutions - excerpt

Worked example

Problem. Combine the conditions $((\frac{2}{3})x - 1 \geq -3)$ AND $((\frac{1}{2})x + 2 < 5)$. Find the exact common interval.

Answer. The solution is $x \geq -3$ AND $x < 6$, or $[-3, 6)$.

Explanation and check.

Solving the fraction inequalities gives the two stated bounds.

Worked example

Problem. Solve $x \leq 7$ AND $x < 4$.

Answer. The result is $x < 4$.

Explanation and check.

The strict bound at 4 is the more restrictive upper condition.