Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Graphing Linear Inequalities and Systems

Graphing Linear Inequalities and Systems | A1-U06-COMB-P07-P08

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for exact boundary, membership or shading decision, and justification and system, common feasible region, and exact justification.

8 PDFs and a README; 186 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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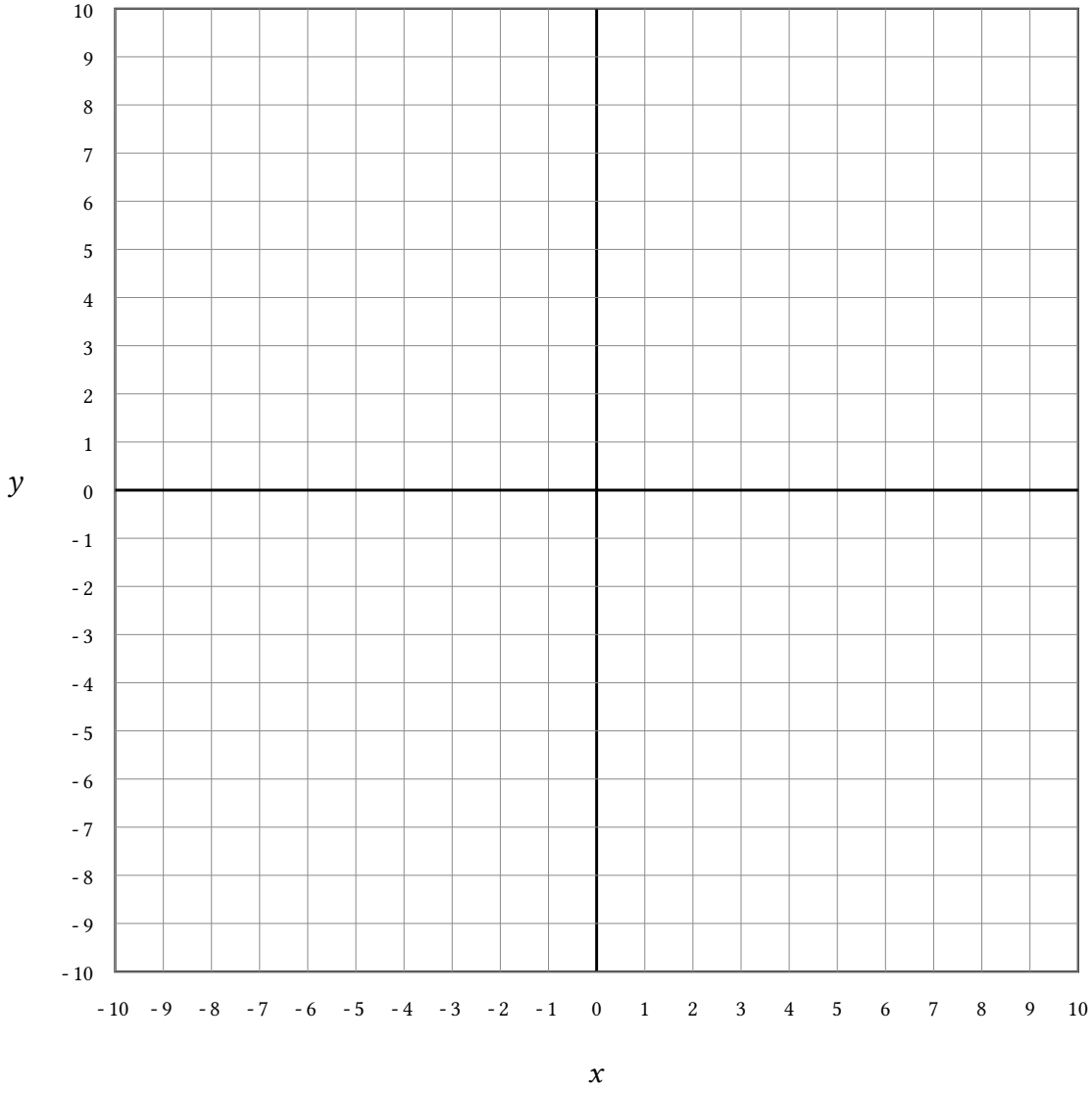
Algebra 1

Graphing Linear Inequalities and Systems

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.

Graph $x - 2y \leq -4$ as one half-plane. Rearrange only as helpful, explicitly track any relation reversal, then give the exact boundary, edge style, and shaded side shown by a decisive off-line test point. For the response cell, record the exact boundary, solid or dashed edge, and shaded side. Still draw or interpret the full required graph and justify every requested part.



Algebra 1

Graphing Linear Inequalities and Systems

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.

For the single inequality $x + y \le -5$, test points $P = (-2, -3), Q = (-3, -4)$, and $R = (-1, -2)$. Complete the substitution table, list every included point, and distinguish boundary equality from interior membership.

Point	x	y	Exact substitutions	Membership / boundary / domain
P	-2	-3	_____	_____
Q	-3	-4	_____	_____
R	-1	-2	_____	_____

For the single inequality $2x + 3y \le -1$, test points $P = (-2, 1), Q = (-4, -2)$, and $R = (0, 4)$. Complete the substitution table, list every included point, and distinguish boundary equality from interior membership.

Point	x	y	Exact substitutions	Membership / boundary / domain
P	-2	1	_____	_____
Q	-4	-2	_____	_____
R	0	4	_____	_____

For the single inequality $3x + y \le -4$, test points $P = (-2, 2), Q = (-5, 1)$, and $R = (1, 3)$. Complete the substitution table, list every included point, and distinguish boundary equality from interior membership.

Point	x	y	Exact substitutions	Membership / boundary / domain
P	-2	2	_____	_____
Q	-5	1	_____	_____
R	1	3	_____	_____

For the single inequality $x + 3y < 6$, test points $P = (-2, \frac{8}{3}), Q = (-3, -\frac{1}{3})$, and $R = (-1, \frac{17}{3})$. Complete the substitution table, list every included point, and distinguish boundary equality from interior membership.

Point	x	y	Exact substitutions	Membership / boundary / domain
P	-2	$\frac{8}{3}$	_____	_____
Q	-3	$-\frac{1}{3}$	_____	_____
R	-1	$\frac{17}{3}$	_____	_____

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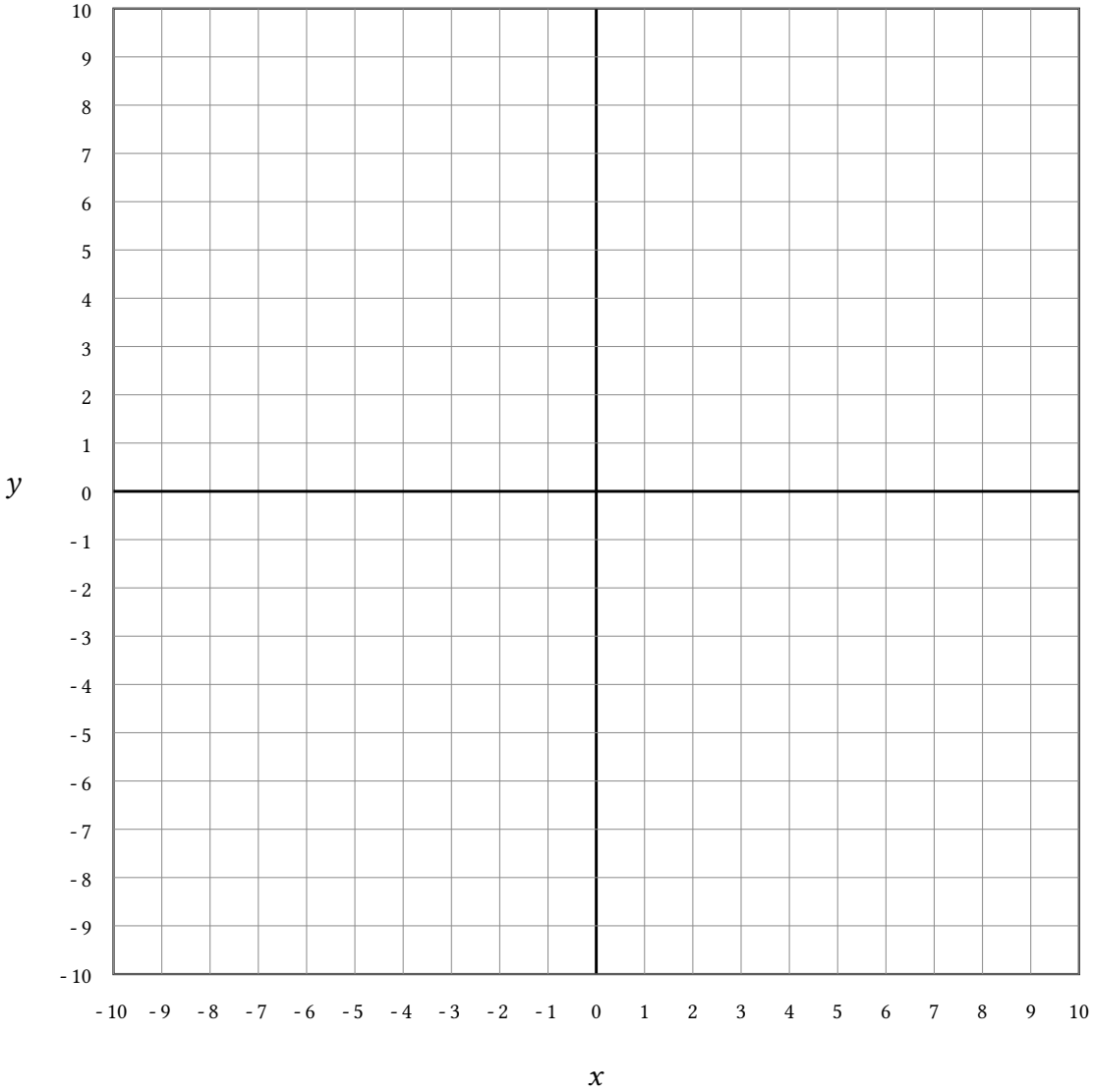
Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Graph $2x - 3y \geq -11$ as one half-plane. Rearrange only as helpful, explicitly track any relation reversal, then give the exact boundary, edge style, and shaded side shown by a decisive off-line test point. For the response cell, record the exact boundary, solid or dashed edge, and shaded side. Still draw or interpret the full required graph and justify every requested part.



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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 $x + y \leq 0$, candidates A, B, and C are listed in the provided graph data. Select a decisive test point for the shading direction, or explain why none is decisive and supply one. A point on the boundary is not an acceptable side test.

Candidate	x	y
A	0	0
B	1	0
C	1	-1

For $3x + y \leq 5$, candidates A, B, and C are listed in the graph payload. Select a decisive test point for the shading direction, or explain why none is decisive and supply one. A point on the boundary is not an acceptable side test.

Candidate	x	y
A	$\frac{5}{3}$	0
B	0	0
C	0	5

Graphing Linear Inequalities and Systems

Full Worked Solutions - excerpt

Worked example

Problem. Classify the full solution set of $x \geq -1$; $x \leq 2$ as bounded, unbounded, empty, a line, or a single point. Prove the classification from the inequalities rather than from the visible graph window.

Answer. For $x \geq -1$; $x \leq 2$, the feasible region is an unbounded strip: x is bounded but y is unrestricted in both directions.

Explanation and check.

For $x \geq -1$; $x \leq 2$, read the parallel and enclosing bounds globally. Here, x is bounded but y is unrestricted in both directions. A witness is $(0, 0)$, which satisfies every constraint. This conclusion does not depend on the plotted window.

Worked example

Problem. Classify the full solution set of $x \geq -1$; $x \leq -1$ as bounded, unbounded, empty, a line, or a single point. Prove the classification from the inequalities rather than from the visible graph window.

Answer. For $x \geq -1$; $x \leq -1$, the feasible region is a line: both inclusive bounds force x to one value while y remains free.

Explanation and check.

For $x \geq -1$; $x \leq -1$, read the parallel and enclosing bounds globally. Here, both inclusive bounds force x to one value while y remains free. A witness is $(-1, 0)$, which satisfies every constraint. This conclusion does not depend on the plotted window.