

Algebra 1 · Graphing Linear Inequalities and Systems of Inequalities · Worksheet

Common Core A-REI.D.12, A-CED.A.3 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

These twenty-two problems practice Common Core standards A-REI.D.12 and A-CED.A.3. Test points, choose solid or dashed boundaries, shade half-planes, write inequalities from graphs, and graph systems of inequalities. The last six are word problems that ask you to write constraints, name the corners of a feasible region, and check which combinations are allowed. Work from easiest to hardest.

Algebra 1 Common Core: A-REI.D.12 · A-CED.A.3

Problem 1: Test a point

Determine whether $(2,1)$ is a solution of $y < 3x$.

Problem 2: Points on the boundary

Determine whether each point is a solution of $2x + 3y \geq 12$.

- a. $(3,2)$
- b. $(1,2)$

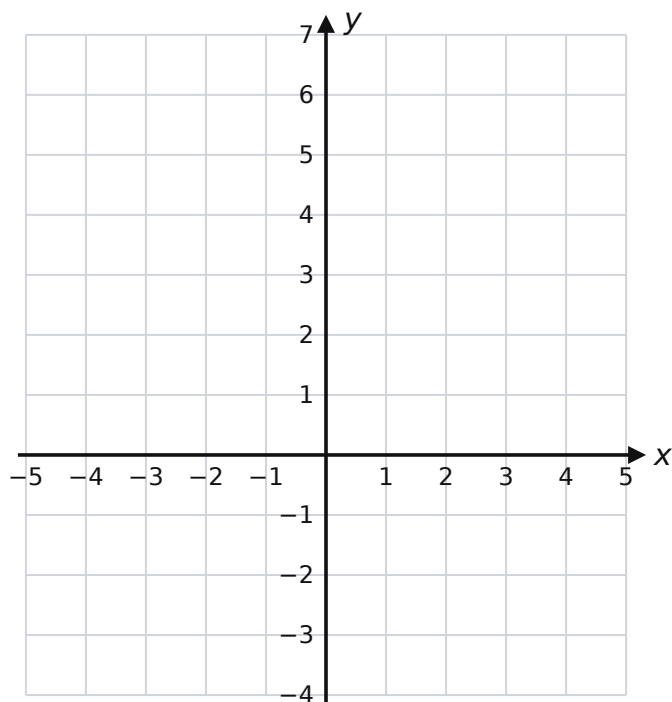
Problem 3: Solid or dashed

State whether the boundary line is solid or dashed for each inequality.

- a. $y > 2x + 1$
- b. $y \leq -x + 4$
- c. $y < \frac{1}{2}x$
- d. $y \geq 3x - 2$

Problem 4: Graph $y > x + 2$

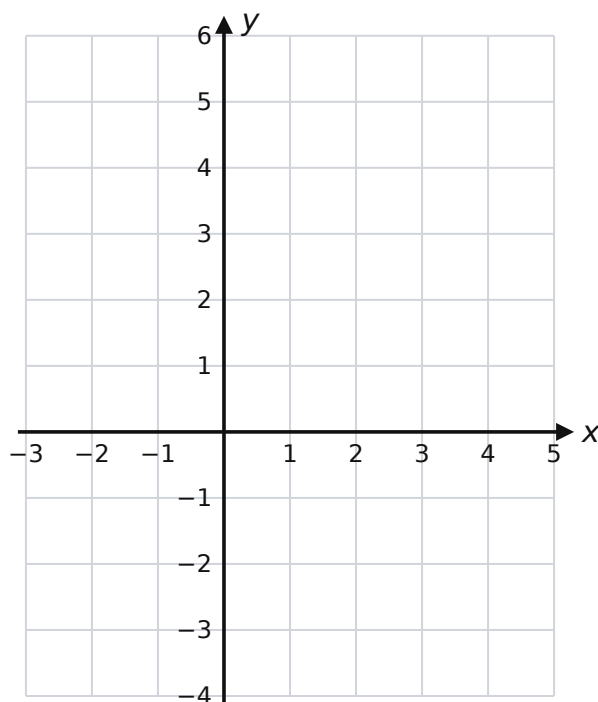
Graph $y > x + 2$.



Grid for graphing.

Problem 5: Graph $y \leq -2x + 3$

Graph $y \leq -2x + 3$.



Grid for graphing.

Problem 6: Graph with a fractional slope

Graph $y \geq \frac{1}{2}x - 1$.

Problem 7: Standard form

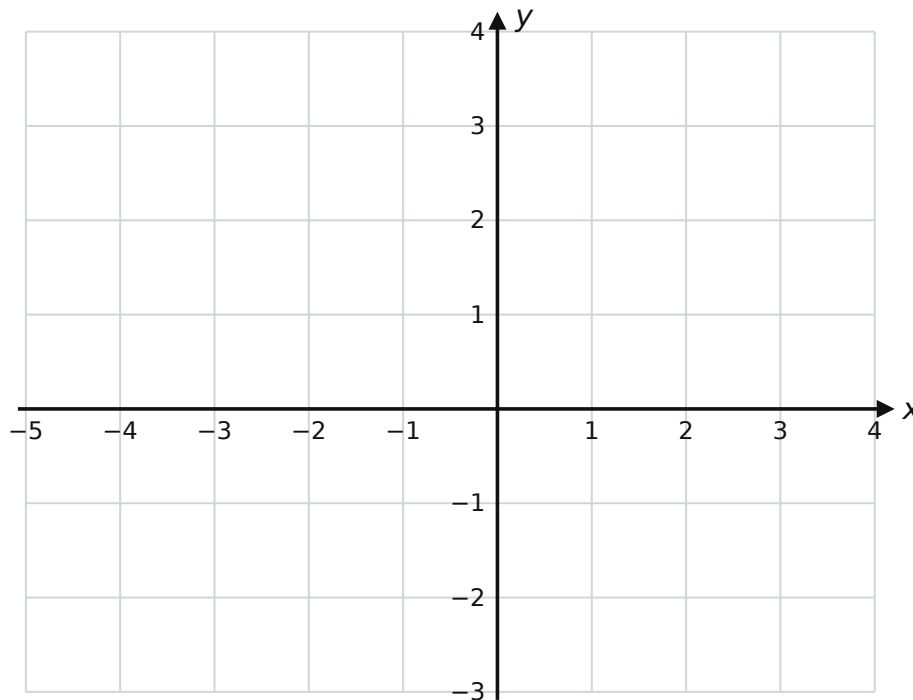
Graph $2x + 3y < 6$ by finding the intercepts of the boundary and testing a point.

Problem 8: Divide by a negative

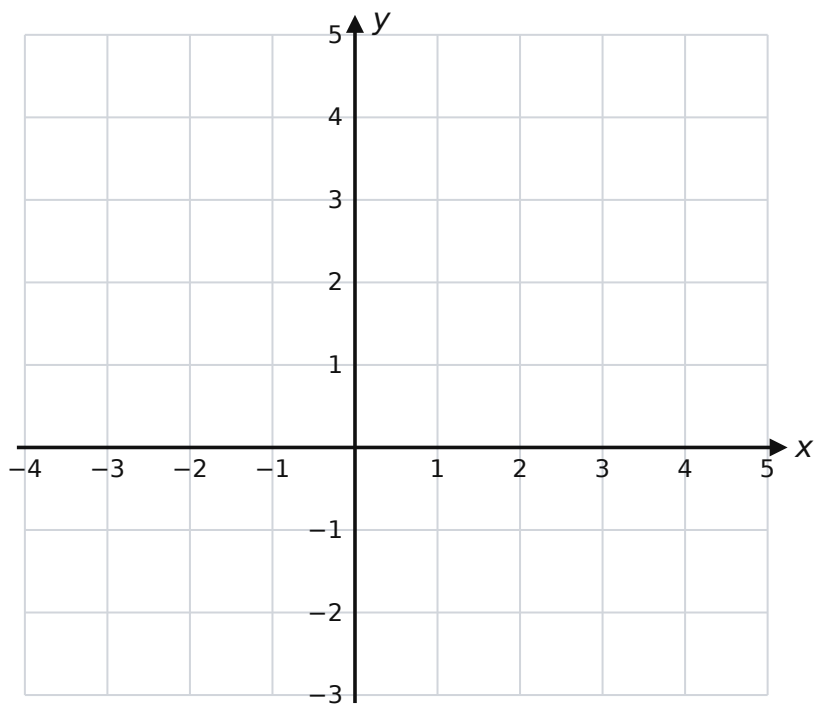
Rewrite $-3y \geq 6x - 9$ in the form $y \leq mx + b$ or $y \geq mx + b$. Then state whether the line is solid or dashed and which side is shaded.

Problem 9: Vertical and horizontal

Graph $x \geq -2$ on one grid and $y < 3$ on another grid.



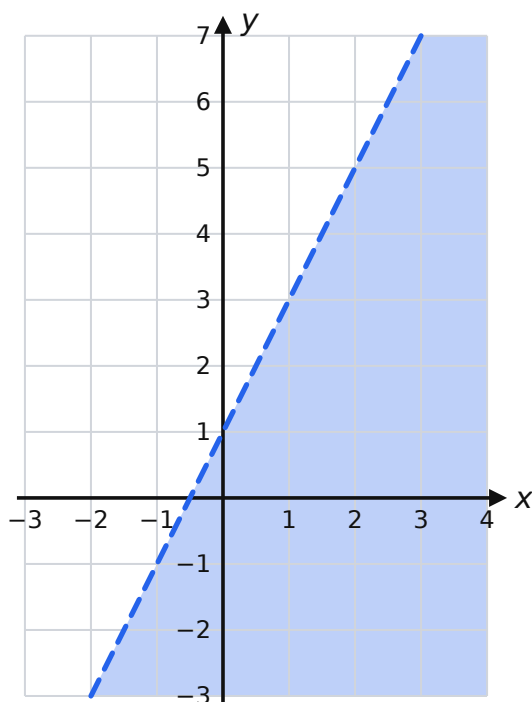
Grid for the first graph.



Grid for the second graph.

Problem 10: Write from a graph: dashed

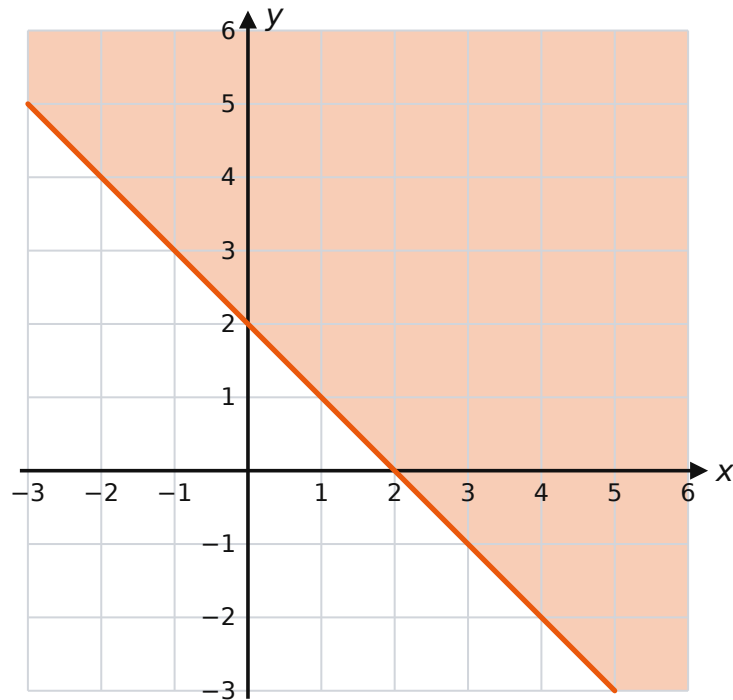
Write the inequality shown by the graph.



A dashed boundary line with the shaded region below it.

Problem 11: Write from a graph: solid

Write the inequality shown by the graph.



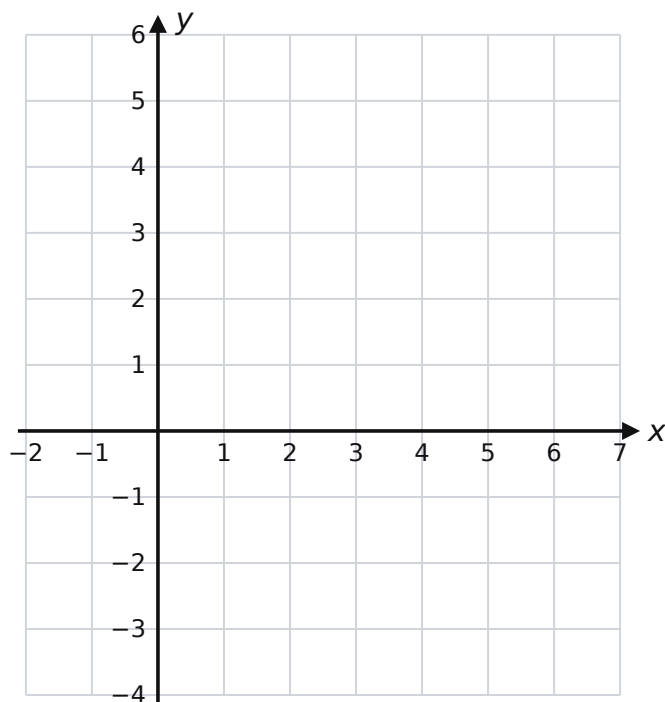
A solid boundary line with the shaded region above it.

Problem 12: Check points in a system

Which of the points $(0,0)$, $(3,1)$, $(2,2)$, $(4,2)$ and $(-1,4)$ are solutions of the system $y > x - 1$ and $y \leq -x + 5$?

Problem 13: Graph a system

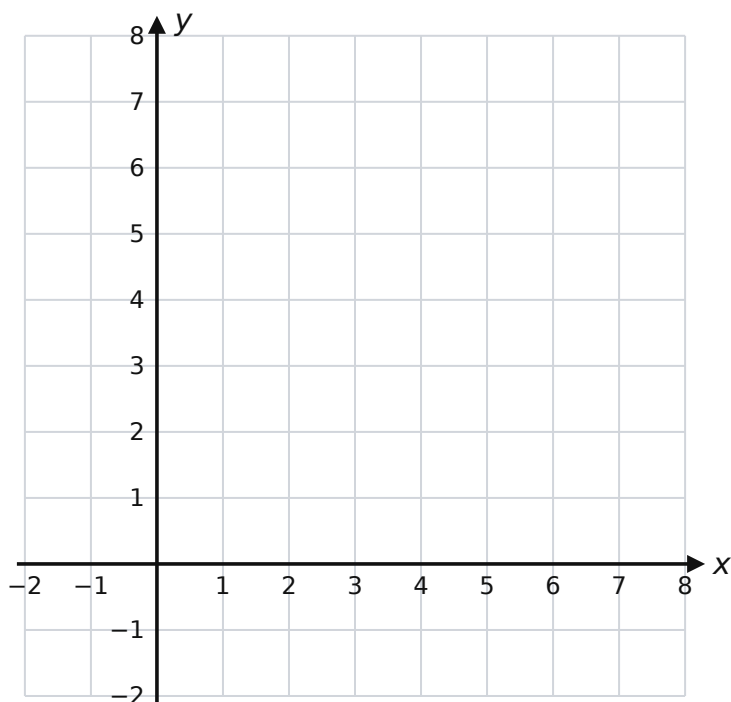
Graph the system $y < -x + 4$ and $y > 2x - 5$. Label the point where the boundaries meet and tell whether it is a solution.



Grid for graphing.

Problem 14: A triangular region

Graph the system $x \geq 0$, $y \geq 0$ and $x + y \leq 6$. Name the corners of the region and tell whether $(2,3)$ is a solution.



Grid for graphing.

Problem 15: A rectangular region

Graph $-2 \leq x \leq 3$ and $1 \leq y \leq 4$. List the corners and find the area of the region.

Problem 16: No overlap

Explain why the system $y > x + 3$ and $y < x - 1$ has no solution.

Problem 17: Concert budget

Balcony tickets cost \$15 and floor tickets cost \$25. A club has at most \$150 to spend. Let x be balcony tickets and y floor tickets. Write an inequality, then decide whether buying (a) 4 balcony and 3 floor, (b) 5 balcony and 3 floor, (c) 2 balcony and 5 floor tickets stays within the budget.

Problem 18: Bake sale limits

A bake sale can make at most 60 items. Let x be muffins and y be cookies. At least 20 cookies are needed. Write a system of inequalities, then decide which of (35,25), (45,20), (30,15) and (20,20) are possible.

Problem 19: Yard work hours

Diego has at most 10 hours this week. A lawn takes 2 hours and a dog walk takes 1 hour. Let x be lawns and y be dog walks. Write a system, name the corners of the feasible region, and decide whether 3 lawns with 4 walks, or 4 lawns with 3 walks, fits his time.

Problem 20: Lemonade goal

Aisha sells cups of lemonade for \$2 and cookies for \$3. She wants to earn at least \$60 and can bake at most 25 cookies. Let x be cups and y be cookies. Write a system and decide whether selling (15, 10), (10, 10) or (30, 25) meets both conditions.

Problem 21: Find the error

Liam graphs $3x - 2y > 6$ with a solid line and shades the side that contains the origin. Describe both mistakes, then graph the inequality correctly.

Problem 22: Garden fence

Noah has at most 40 feet of fence for a rectangular garden. The length x must be at least 8 feet and the width y at least 4 feet. Write a system of inequalities, find the corners of the feasible region, and check whether a 10 ft by 8 ft garden is allowed.