

Algebra 1 · Graphing Linear Inequalities and Systems of Inequalities · Test Answer Key

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

Use this key to score the test out of 20 points. Each solution shows the graph or reasoning and a scoring guide, so partial credit can be given when the boundary is right but the shading is not. Accept any equivalent form of an inequality.

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

Question 1: Test two points (2 points)

- a. $2 > 2(-1) - 3 = -5$ is true. **Yes.**
- b. $-4 > 2(3) - 3 = 3$ is false. **No.**

Scoring: 1 point per part for the substitution and the correct conclusion.

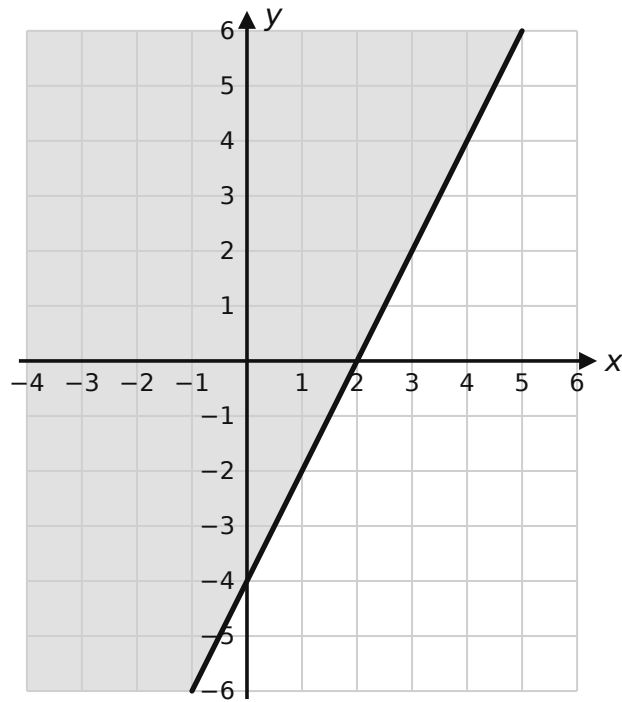
Question 2: Line and shading (2 points)

- a. Dashed line, shaded **below**.
- b. Solid line, shaded **above**.

Scoring: 1 point per part; both the line type and the shading side must be correct.

Question 3: Graph one inequality (2 points)

The boundary passes through $(0, -4)$ and $(2, 0)$ and is solid. Test $(0, 0)$: $0 \geq -4$ is true, so shade the side with the origin, above the line.

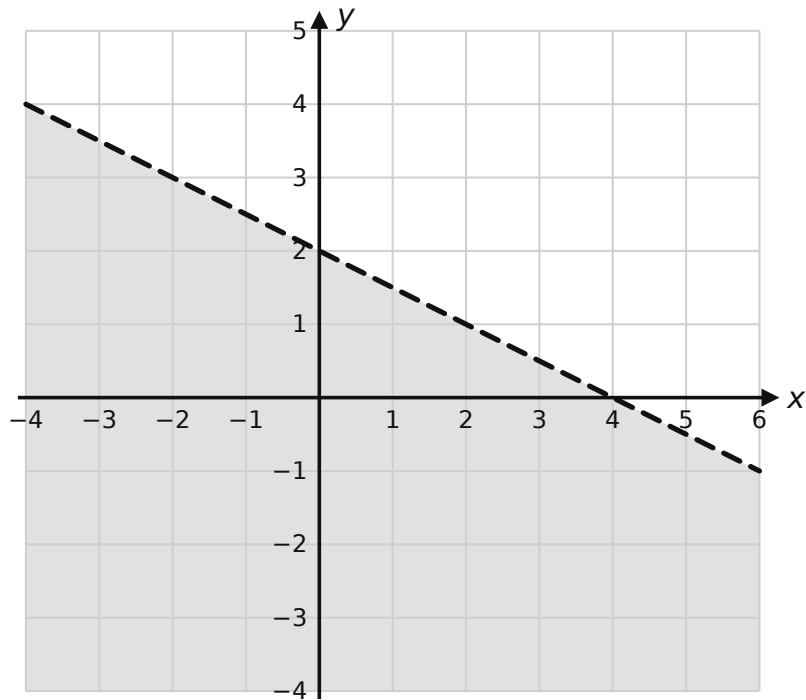


Solid line, region above shaded.

Scoring: 1 point for the correct solid boundary, 1 point for shading the correct side.

Question 4: Standard form (2 points)

The intercepts are $(4,0)$ and $(0,2)$. The boundary is dashed. Test $(0,0)$: $0 < 4$ is true, so shade the side containing the origin.



Dashed line, origin side shaded.

Scoring: 1 point for the dashed boundary through both intercepts, 1 point for correct shading.

Question 5: Write from a graph (2 points)

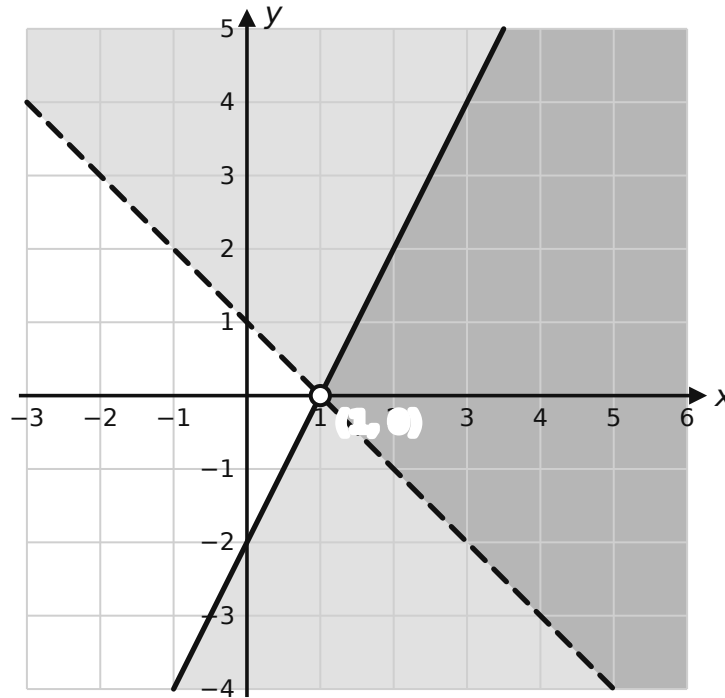
The line passes through $(0,1)$ and $(2,2)$, so its slope is $\frac{1}{2}$ and its equation is $y = \frac{1}{2}x + 1$. The line is solid and the shading is below it.

The inequality is $y \leq \frac{1}{2}x + 1$.

Scoring: 1 point for the boundary equation, 1 point for the correct symbol.

Question 6: Graph a system (2 points)

$y = -x + 1$ is dashed with shading above. $y = 2x - 2$ is solid with shading below. They meet where $-x + 1 = 2x - 2$, so $x = 1$ and $y = 0$. The point $(1,0)$ is not a solution, because $0 > 0$ is false.



The darker overlap is the solution set.

Scoring: 1 point for both boundary lines with the correct line types, 1 point for the correct overlapping region.

Question 7: Read a system (2 points)

- The bottom edge is solid with shading above: $y \geq 1$. The left edge is solid with shading to the right: $x \geq -1$. The slanted edge $y = -x + 4$ is dashed with shading below: $y < -x + 4$.
- (1,2): $2 \geq 1$, $1 \geq -1$ and $2 < 3$ are true, so **yes**. (3,2): $2 < 1$ is false, so **no**.

Scoring: 1 point for all three inequalities correct, 1 point for both decisions.

Question 8: Overlap or not (2 points)

- A solution would need $2x+1 < y < 2x-3$, so $2x+1 < 2x-3$, which gives $1 < -3$. That is false, so **there is no solution**: the lines are parallel and the regions do not overlap.
- Both conditions hold only when $y = 3$. The solution set is **the horizontal line $y = 3$** .

Scoring: 1 point per part for the correct conclusion with a valid reason.

Question 9: Bake sale goal (2 points)

- $3x+2y \geq 48$
- $3(10)+2(9)=30+18=48$, and $48 \geq 48$ is true. **Yes, the goal is reached.**

Scoring: 1 point for each part.

Question 10: Shirts and caps (2 points)

- a. $8x+6y \leq 24$, $x \geq 2$ and $y \geq 0$.
- b. 3 shirts and 1 cap: $8(3)+6(1)=30 > 24$. **Not possible.** 2 shirts and 1 cap: $16+6=22 \leq 24$ and $2 \geq 2$. **Possible.**

Scoring: 1 point for the cost inequality and the shirt minimum, 1 point for both decisions.

Total
20 points