

# Algebra 1 - Linear Inequalities in Two Variables and Systems - Worksheet

Common Core A-REI.D.12, A-CED.A.3 · [maths-pdf.fr/en/](https://maths-pdf.fr/en/)

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

This worksheet has 20 problems on linear inequalities in two variables and systems, aligned to Common Core A-REI.D.12 and A-CED.A.3. You will test points, graph half-planes with solid or dashed boundaries, solve systems of inequalities, and decide which combinations fit real constraints. Early problems check one skill at a time; the final six put the skill inside real situations. Write each step on paper before you look at the answer key.

**Algebra 1** · Common Core State Standards: **A-REI.D.12, A-CED.A.3**

## Exercise 1 - Test a point

Is  $(2,1)$  a solution of  $y < x + 2$ ?

## Exercise 2 - Not a solution

Is  $(0,-2)$  a solution of  $y \geq 2x + 3$ ?

## Exercise 3 - Solid or dashed

State whether the boundary line is solid or dashed: (a)  $y \geq 2x - 1$  (b)  $y < -x + 4$  (c)  $y > 3$ .

## Exercise 4 - Graph $y > x + 1$

Graph  $y > x + 1$ .

## Exercise 5 - Graph with a solid line

Sketch the graph of  $4x + y \geq 4$  and state which side of the boundary is shaded.

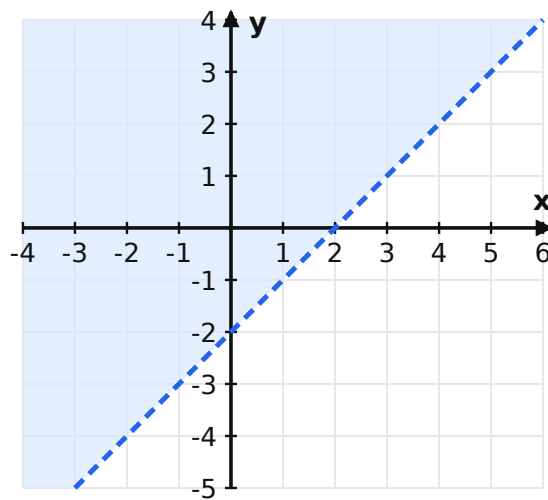
## Exercise 6 - Vertical boundary

Graph  $x \geq 2$ .

## Exercise 7 - Horizontal boundary

Graph  $y < 3$ .

### Exercise 8 - Write from a graph



A shaded half-plane.

Write the inequality graphed.

### Exercise 9 - Standard form inequality

Graph  $2x + 3y \leq 12$ .

### Exercise 10 - Negative coefficient

Graph  $3x - y > 3$ .

### Exercise 11 - Which points work?

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

### Exercise 12 - System of two inequalities

Graph the system  $y \geq \frac{1}{2}x - 2$  and  $y < -x + 4$ .

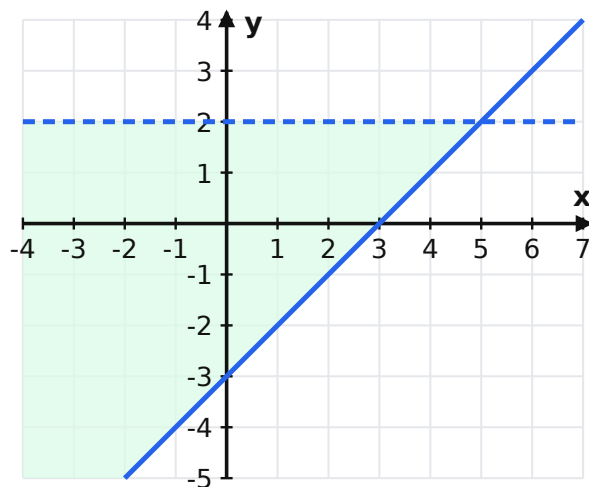
### Exercise 13 - Triangular region

Graph the system  $x \geq 0$ ,  $y \geq 0$ , and  $x + y \leq 5$ . Is  $(2,2)$  a solution?

### Exercise 14 - Check a system

Is  $(3,2)$  a solution of  $y > x - 2$  and  $y \leq 2x$ ?

### Exercise 15 - Write a system from a graph



Shaded region.

Write the system of inequalities shown in the graph.

### Exercise 16 - Lunch budget

| Item  | Price |
|-------|-------|
| Wrap  | \$5   |
| Juice | \$3   |

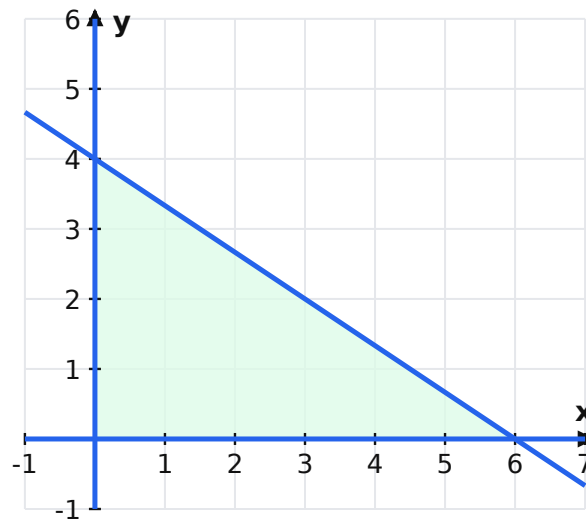
Prices.

Priya has at most \$30 to spend. Wraps cost \$5 and juices cost \$3. Write an inequality for the numbers of wraps  $x$  and juices  $y$  and decide whether she can buy 3 wraps and 5 juices.

### Exercise 17 - Two jobs

Mei works at most 12 hours a week. She earns \$10 per hour tutoring ( $x$  hours) and \$8 per hour at a store ( $y$  hours). She wants at least \$90. Write a system and decide whether 6 hours tutoring and 5 hours at the store works. What about 4 and 4?

### Exercise 18 - Whole-number combinations



Possible combinations.

A craft kit uses 2 beads of type A and 3 beads of type B per bracelet style, and a student has at most 12 beads in total:  $2x + 3y \leq 12$  with  $x$  and  $y$  whole numbers at least 0. How many whole-number pairs  $(x, y)$  work?

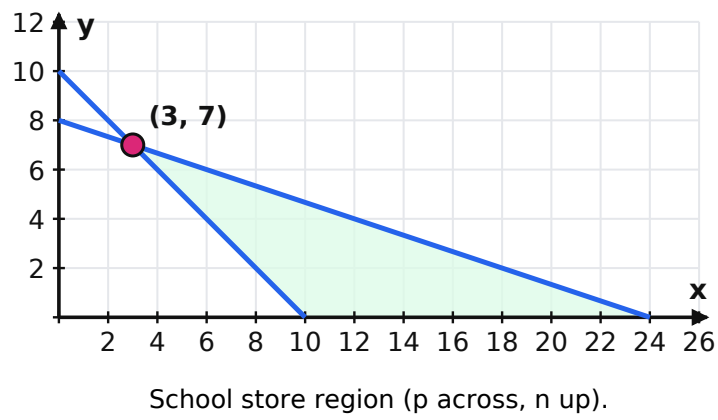
### Exercise 19 - Truck load

A truck can carry at most 280 pounds. Small crates weigh 25 pounds ( $x$ ) and large crates weigh 40 pounds ( $y$ ). Write an inequality. Can it carry 4 small and 4 large crates? 6 small and 4 large?

### Exercise 20 - School store

A school store needs to sell at least 10 items and stay under a \$24 budget. Pencils cost \$1 each ( $p$ ) and notebooks cost \$3 each ( $n$ ). Write the system  $p + n \geq 10$  and  $p + 3n \leq 24$ . Is  $(6, 4)$  a solution? Is  $(2, 8)$ ?

### Exercise 21 - Corner of the region



Find the corner of the feasible region in the school store problem where the lines  $p+n=10$  and  $p+3n=24$  meet.