

Algebra 1 · Systems of Linear Equations · Worksheet

Common Core A-REI.C.5, A-REI.C.6, A-REI.D.11, A-CED.A.3 · mathovore.fr

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

These twenty-four problems practice Common Core standards A-REI.C.5, A-REI.C.6, A-REI.D.11 and A-CED.A.3. Solve systems of linear equations by graphing, substitution and elimination, decide how many solutions a system has, and find where a line meets a parabola or an exponential curve. The last six are word problems about tickets, mixtures, phone plans and savings. Work from easiest to hardest.

Algebra 1 Common Core: A-REI.C.5 · A-REI.C.6 · A-REI.D.11 · A-CED.A.3

Problem 1: Check an ordered pair

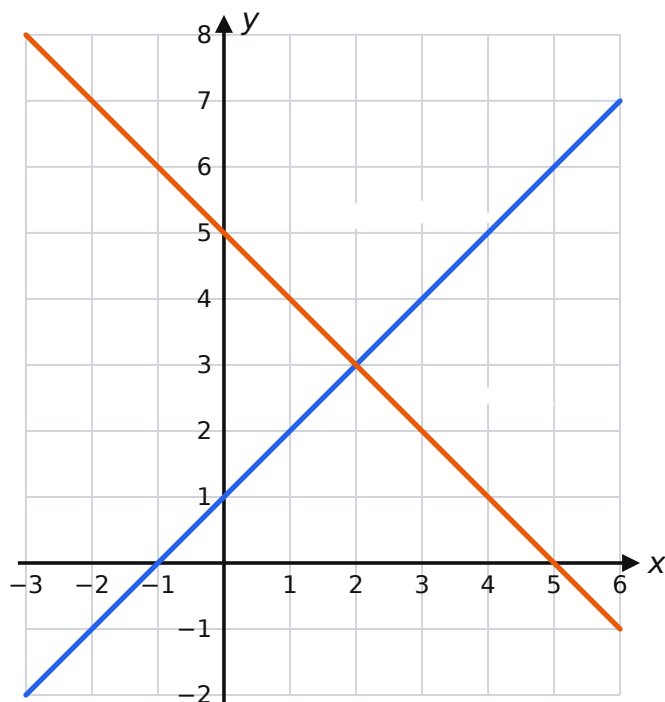
Determine whether $(3,2)$ is a solution of the system $x+y=5$ and $2x-y=4$.

Problem 2: Test a second pair

Determine whether $(4,1)$ is a solution of the system $3x-y=11$ and $x+2y=7$.

Problem 3: Read a graph

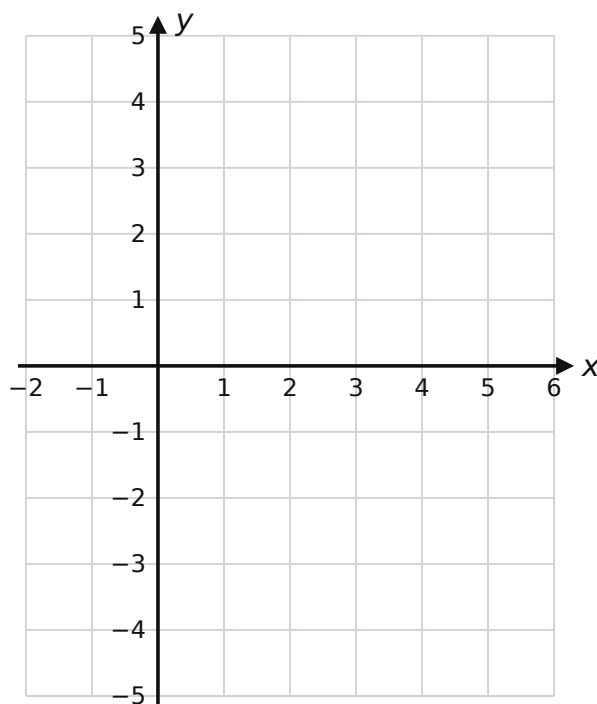
The graph shows $y=x+1$ and $y=-x+5$. Read the solution of the system from the graph, then check it in both equations.



The graphs of $y = x + 1$ and $y = -x + 5$.

Problem 4: Solve by graphing

Graph $y = 2x - 3$ and $y = -x + 3$ on the grid. Name the point where the lines cross and check it.



Grid for graphing both lines.

Problem 5: Substitute $y = 3x$

Solve the system $y = 3x$ and $x + y = 20$ by substitution.

Problem 6: Substitute an expression

Solve the system $y = x + 4$ and $2x + y = 19$.

Problem 7: Isolate a variable first

Solve the system $x + 2y = 11$ and $3x - y = 12$.

Problem 8: Substitution with a fraction

Solve the system $y = \frac{1}{2}x + 3$ and $3x + 2y = 18$.

Problem 9: Add the equations

Solve the system $x + y = 9$ and $x - y = 3$.

Problem 10: Eliminate y

Solve the system $3x + 2y = 16$ and $5x - 2y = 16$.

Problem 11: Multiply one equation

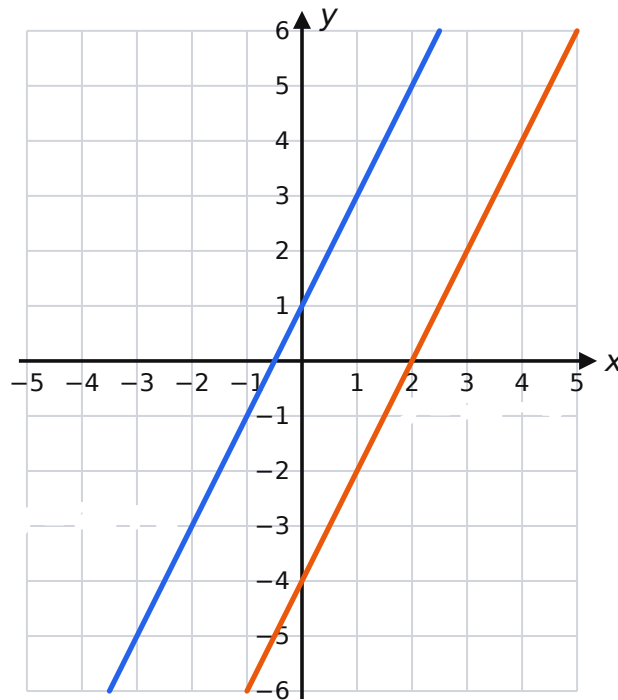
Solve the system $4x + 3y = 17$ and $2x - y = 1$.

Problem 12: Multiply both equations

Solve the system $3x + 4y = 1$ and $2x + 5y = 3$.

Problem 13: Parallel lines

The graph shows $y = 2x + 1$ and $y = 2x - 4$. How many solutions does the system have? Explain using slopes and intercepts.



The graphs of $y = 2x + 1$ and $y = 2x - 4$.

Problem 14: Same line twice

Show that the system $2x + 4y = 8$ and $x + 2y = 4$ has infinitely many solutions.

Problem 15: Classify three systems

Without graphing, tell whether each system has one solution, no solution or infinitely many solutions.

- $y = 3x - 2$ and $6x - 2y = 4$
- $y = -x + 1$ and $2x + 2y = 5$
- $y = x + 3$ and $y = 2x + 3$

Problem 16: Why elimination works

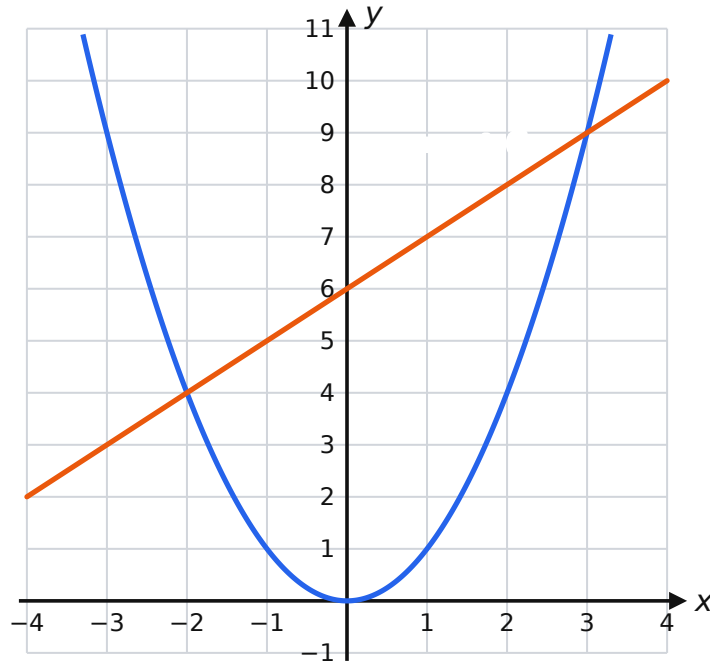
The pair $(2, 1)$ solves both $x + y = 3$ and $x - y = 1$.

- Add the two equations to write a new equation.
- Show that $(2, 1)$ satisfies the new equation.
- Explain why a pair that solves both original equations must solve their sum.

Problem 17: Line and parabola

The graphs of $y = x^2$ and $y = x + 6$ are shown. Use the graph to solve $x^2 = x + 6$, then verify each

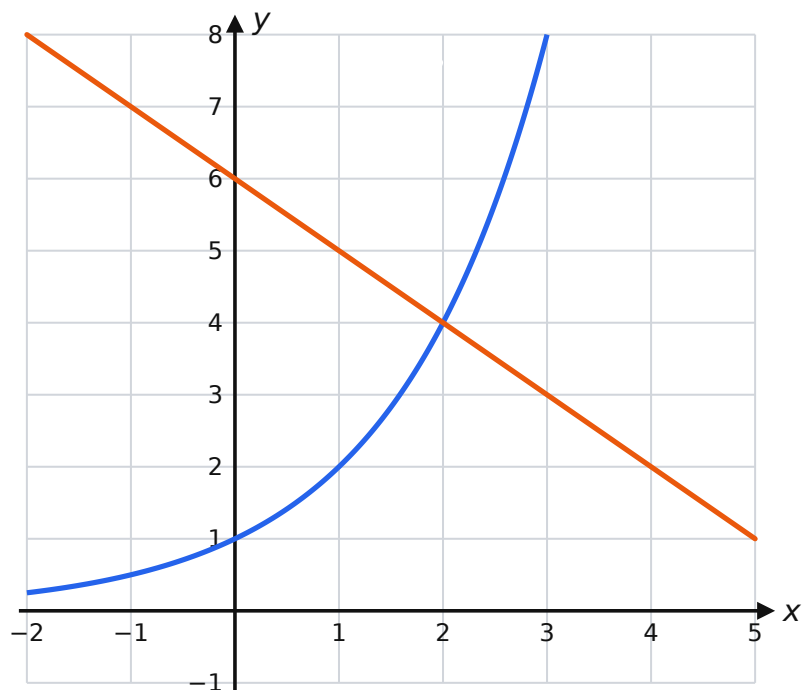
solution algebraically.



The graphs of $y = x^2$ and $y = x + 6$.

Problem 18: Line and exponential

Complete a table of values for $y = 2^x$ and $y = 6 - x$ when $x = 0, 1, 2, 3$. Use it to solve $2^x = 6 - x$, and explain why there is only one solution.



The graphs of $y = 2^x$ and $y = 6 - x$.

Problem 19: Ticket sales

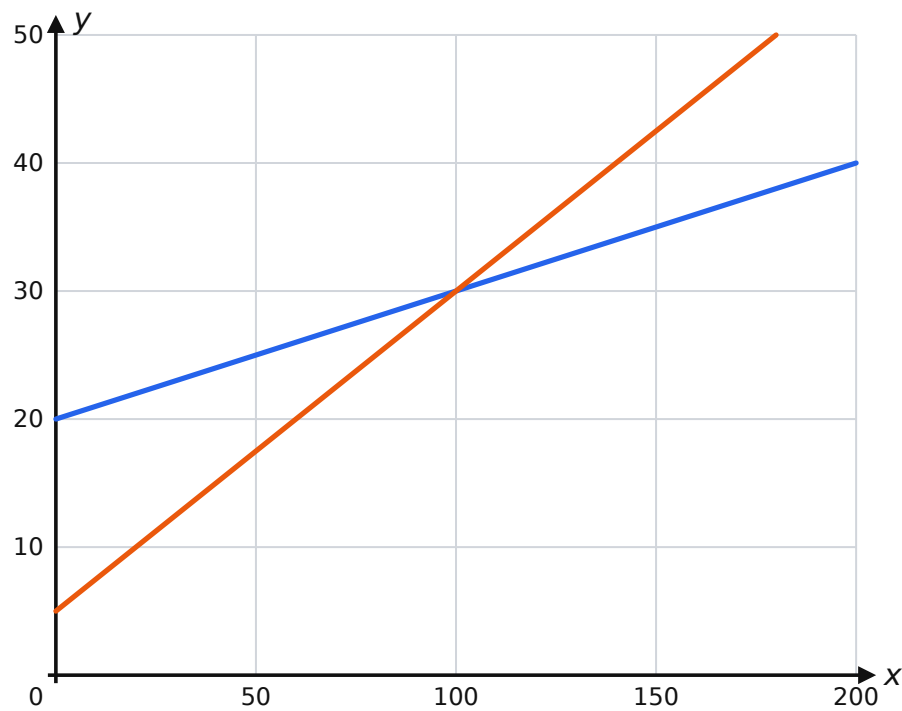
A school play sold 120 tickets. Adult tickets cost \$8 and student tickets cost \$5. Total sales were \$795. How many tickets of each kind were sold?

Problem 20: Coffee blend

Mei mixes beans that cost \$6 per pound with beans that cost \$9 per pound to make 30 pounds of a blend worth \$7 per pound. How many pounds of each kind does she use?

Problem 21: Phone plans

Plan A costs \$20 per month plus \$0.10 per minute. Plan B costs \$5 per month plus \$0.25 per minute. The graph shows both plans. After how many minutes do the plans cost the same, and what is that cost? Which plan is cheaper for 150 minutes?



Monthly cost of each plan.

Problem 22: Animals on a farm

A farm has only chickens and cows. Together there are 40 animals with 110 legs. How many chickens and how many cows are there?

Problem 23: Boat and current

A boat travels 24 miles downstream in 2 hours and returns the 24 miles upstream in 3 hours. Find the speed of the boat in still water and the speed of the current.

Problem 24: Saving for a bike

Maya has \$12 and saves \$6 each week. Jamal has \$40 and saves \$2 each week. After how many weeks will they have the same amount, and how much is it?