

Algebra 1 · Functions, Domain, Range and Function Notation · Worksheet

Common Core F-IF.A.1, F-IF.A.2, F-IF.B.5 · mathovore.fr

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

These 23 problems practice the core ideas of F-IF.A.1, F-IF.A.2 and F-IF.B.5. You will decide when a relation is a function, evaluate functions written with function notation, and state the domain and range from equations, tables, graphs and stories.

Early problems are short and visual. The last six are word problems that ask you to interpret outputs such as $f(a)=b$ and to choose sensible domains.

Algebra 1 Common Core: F-IF.A.1 · F-IF.A.2 · F-IF.B.5

Problem 1: Function from ordered pairs

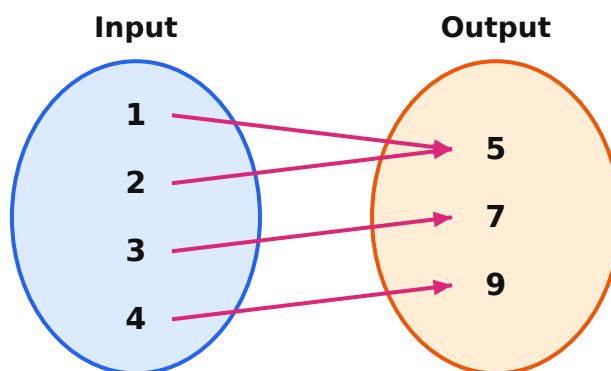
Decide whether the relation $\{(1,4),(2,7),(3,10),(4,13)\}$ is a function. Explain.

Problem 2: Repeated input

Decide whether $\{(2,5),(3,8),(2,9),(4,1)\}$ is a function. Explain.

Problem 3: Mapping diagram

Does the mapping diagram show a function? Explain.



Inputs 1 and 2 share the output 5, but each input has only one arrow, so this is a function.

Problem 4: Function from a table

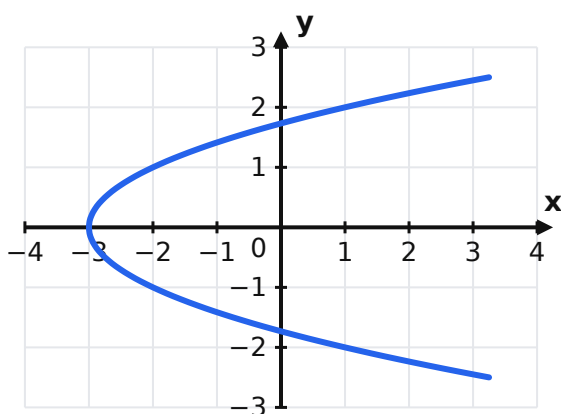
Does the table define y as a function of x ? Explain.

x	2	5	2	8
y	4	7	6	9

A table of four input-output pairs.

Problem 5: Vertical line test: curve

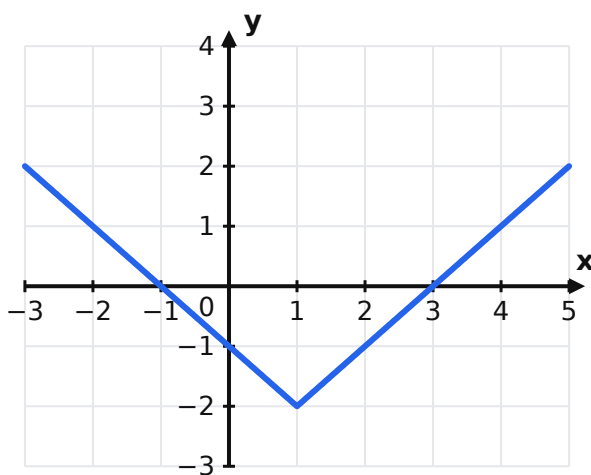
Use the vertical line test to decide whether the graph shows a function.



The curve $x = y^2 - 3$.

Problem 6: Vertical line test: V shape

Use the vertical line test to decide whether the graph shows a function.



The graph of $y = |x - 1| - 2$.

Problem 7: Evaluate a linear function

Let $f(x) = 3x - 5$. Find $f(4)$, $f(-2)$ and $f(0)$.

Problem 8: Evaluate a quadratic function

Let $g(x) = x^2 + 2x - 8$. Find $g(3)$, $g(-4)$ and $g(0)$.

Problem 9: Evaluate an absolute value function

Let $h(x) = |x - 4| + 3$. Find $h(1)$, $h(4)$ and $h(9)$.

Problem 10: Negative and fractional inputs

Let $k(x) = -2x^2 + 5x$. Find $k(-3)$ and $k\left(\frac{1}{2}\right)$.

Problem 11: Find the input

Let $f(x) = 2x + 7$. Find x when $f(x) = 19$, and find x when $f(x) = -5$.

Problem 12: Read a function table

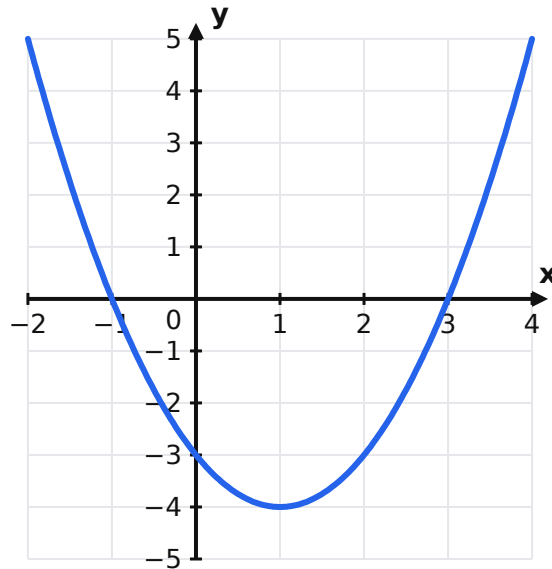
The table gives some values of a function f . Find $f(2)$, find $f(-1)$, and find every x with $f(x) = 3$.

x	-1	0	1	2	3
f(x)	3	0	-1	0	3

Values of a function f .

Problem 13: Read a function graph

Use the graph to find $f(0)$, $f(4)$, and all x with $f(x) = 0$.



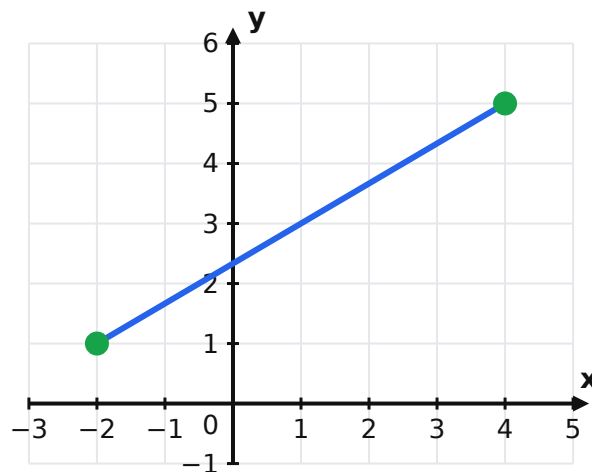
The graph of $f(x) = x^2 - 2x - 3$.

Problem 14: Input with a variable

Let $f(x) = 3x - 2$. Write simplified expressions for $f(a+1)$ and $f(2a)$.

Problem 15: Domain and range of a segment

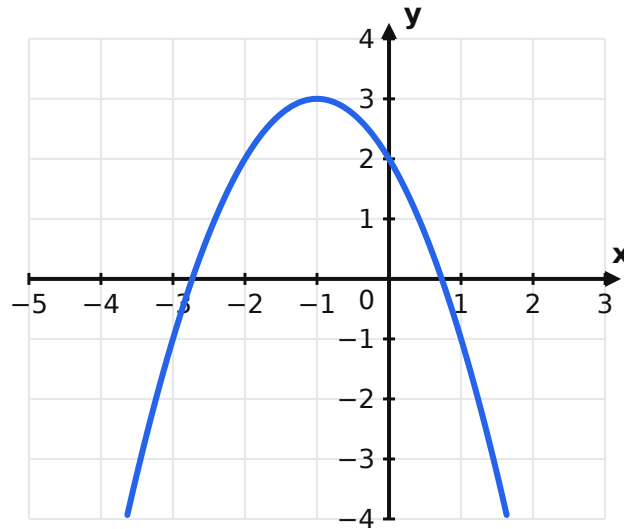
State the domain and range of the function shown. Use inequalities.



A line segment with endpoints $(-2, 1)$ and $(4, 5)$.

Problem 16: Domain and range of a parabola

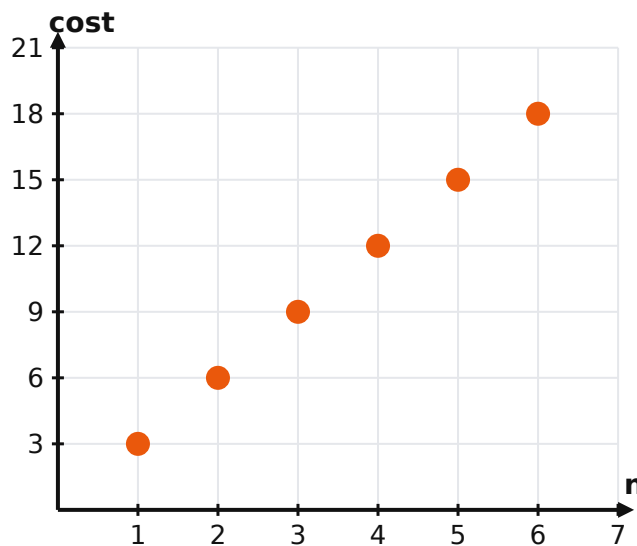
State the domain and range of the function whose graph is shown.



The graph of $y = -(x+1)^2 + 3$; it continues downward forever on both sides.

Problem 17: Cupcake sale (discrete)

At a bake sale, cupcakes cost \$3 each. A customer may buy 1 to 6 cupcakes. The cost is $C(n) = 3n$. State the domain and range, and tell whether the situation is discrete or continuous.



Cost of n cupcakes. The points are not connected: you cannot buy half a cupcake.

Problem 18: Birthday relation

In a class, each student is paired with his or her birthday. Is this relation a function from students to birthdays? Is the reverse relation, birthdays to students, a function? Explain.

Problem 19: Plumber charges

A plumber charges $C(h) = 25h + 40$ dollars for a job that takes h hours. Explain what $C(3) = 115$ means, then find $C(2.5)$.

Problem 20: Height of a tossed ball

The height of a ball in feet, t seconds after it is tossed, is $h(t) = -16t^2 + 48t + 4$. Explain what $h(2) = 36$ means, and find $h(1.5)$.

Problem 21: Filling a tank (continuous)

An empty tank holds 40 gallons. It fills at 5 gallons per minute until it is full, so $V(t) = 5t$. State the domain and range, and tell whether the situation is discrete or continuous.

Problem 22: Taxi fare

A taxi fare is $F(m) = 2.50 + 1.75m$ dollars for a ride of m miles. Find $F(6)$. Then find the distance of a ride that costs \$20.00.

Problem 23: Garden area

Sofia has 40 feet of fence for a rectangular garden. If the width is w feet, the length is $20 - w$ feet, and the area is $A(w) = w(20 - w)$ square feet. Find $A(8)$. Find the widths with area 75 ft². State a reasonable domain and range.