

Grade 8 · Introduction to Functions · Worksheet

Common Core 8.F.A.1, 8.F.A.2, 8.F.A.3 · mathovore.fr

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

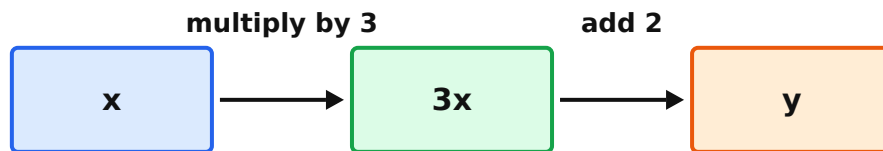
These problems practice Common Core standards 8.F.A.1, 8.F.A.2 and 8.F.A.3. Decide whether a table, mapping, graph or equation is a function, evaluate and write function rules, and tell linear from nonlinear. Then compare two functions shown in different ways.

The last seven problems are real-world situations such as rentals, savings and tanks. Work from easiest to hardest and explain each answer in a sentence.

Grade 8 Common Core: 8.F.A.1 · 8.F.A.2 · 8.F.A.3

Problem 1: Function machine

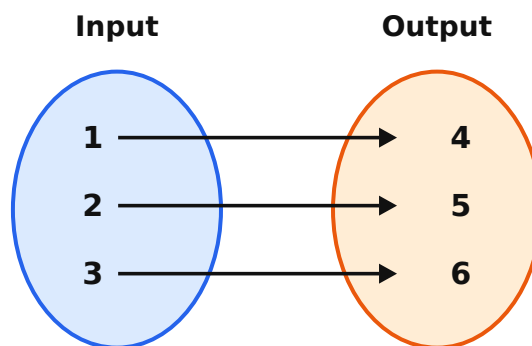
A function machine follows the rule $y = 3x + 2$. Find the output for each input: 1, 2, 3 and 4.



The machine multiplies by 3, then adds 2.

Problem 2: Mapping diagram

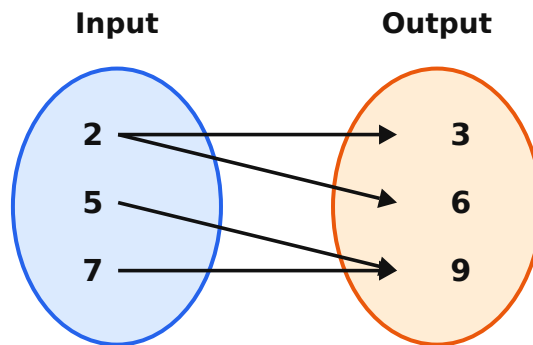
Does the mapping diagram show a function? Explain.



Inputs on the left, outputs on the right.

Problem 3: Two arrows from one input

Does this mapping diagram show a function? Explain.



Notice the arrows from the input 2.

Problem 4: Repeated input in a table

Is the relation in the table a function? Explain.

x	y
1	3
2	6
3	9
2	7

The input 2 appears twice.

Problem 5: Same output every time

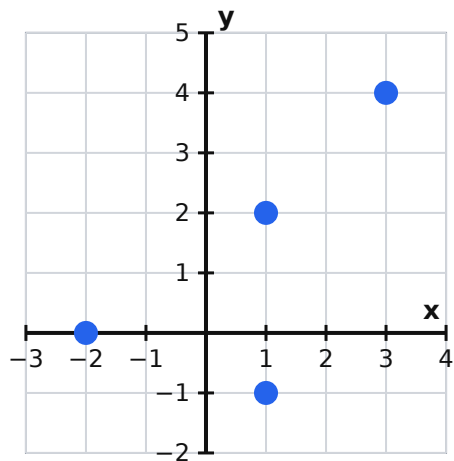
The table gives inputs 0, 1, 2, 3 and the output 5 each time. Is it a function?

Problem 6: Ordered pairs

Decide whether the set of ordered pairs $(1,2)$, $(2,4)$, $(3,6)$, $(4,8)$ is a function. If it is, write the rule.

Problem 7: Points on a graph

The graph shows four points. Is the relation a function? Explain.



Points $(1,2)$, $(1,-1)$, $(3,4)$ and $(-2,0)$.

Problem 8: Evaluate a function

For $f(x) = -2x + 7$, find $f(-3)$, $f(0)$ and $f(4)$.

Problem 9: Write the rule

Write an equation for the function in the table.

x	y
1	7
2	10
3	13
4	16

Inputs and outputs of a function.

Problem 10: Graph a function

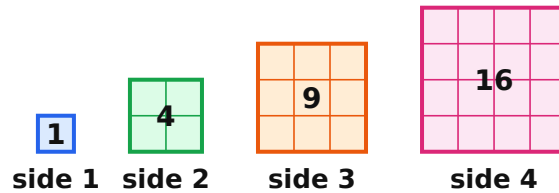
Complete a table for $y = x - 2$ using $x = -1, 0, 1, 2, 3$. Then plot the points and tell what shape they form.

Problem 11: Linear form

Is $y = 4x - 1$ a linear function? Identify m and b .

Problem 12: Area of a square

The area of a square is $A = s^2$. The figure shows squares with sides 1, 2, 3 and 4. Make a table of side and area. Is the function linear?



Squares and their areas.

Problem 13: Linear or nonlinear tables

Decide whether each table is linear.

- a. x : 0, 1, 2, 3 and y : 2, 5, 8, 11
- b. x : 1, 2, 3, 4 and y : 1, 4, 9, 16

Problem 14: Which are linear?

Which of these equations are linear? $y = 5x$, $y = x^2 + 1$, $y = 7 - x$, $y = \frac{2}{x}$.

Problem 15: Slope and starting value

For $y = -\frac{1}{2}x + 6$, name the rate of change and the initial value, then find the output when $x = 4$.

Problem 16: Equation versus table

Function A is $y = 2x + 3$. Function B is shown in the table. Which function has the greater rate of change? Which has the greater initial value?

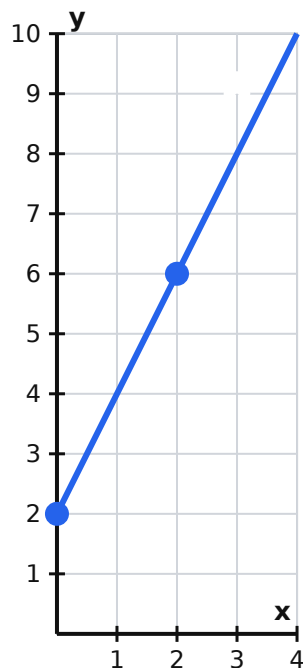
x	y
0	1
1	5
2	9
3	13

Function B.

Problem 17: Graph versus equation

Function A is graphed through (0,2) and (2,6). Function B is $y = 3x + 1$. Compare their rates of

change and initial values.



Function A.

Problem 18: Car rental

A car rental costs a flat fee plus a daily charge. The table shows the cost for 1 to 4 days. Write a rule for the cost C in terms of days d and find the cost for 6 days.

Days	Cost
1	\$55
2	\$90
3	\$125
4	\$160

Rental cost by number of days.

Problem 19: Comparing savings

Maya saves with the rule $M = 12 + 6w$, where w is weeks. Jamal's savings are in the table. Who saves money faster, and who has more after 10 weeks?

Weeks	Jamal
0	\$40
1	\$45
2	\$50
3	\$55

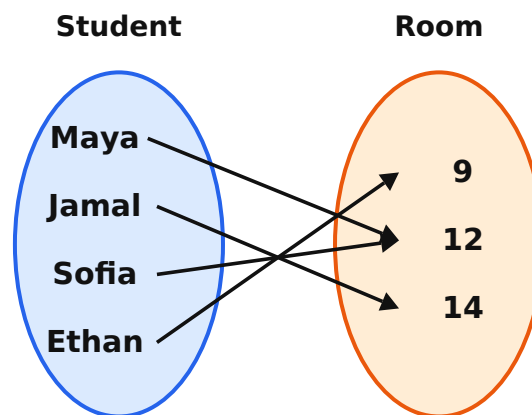
Jamal's savings.

Problem 20: Garden square

A square garden has side s feet. Its area is $A = s^2$ and its perimeter is $P = 4s$. Find A and P for $s = 3, 5, 8$. Which function is linear? What happens to each when the side doubles from 3 to 6?

Problem 21: Homeroom function

Each student has one homeroom, as shown. Is "student to room" a function? Is "room to student" a function? Explain both.



Students and homeroom numbers.

Problem 22: Temperature conversion

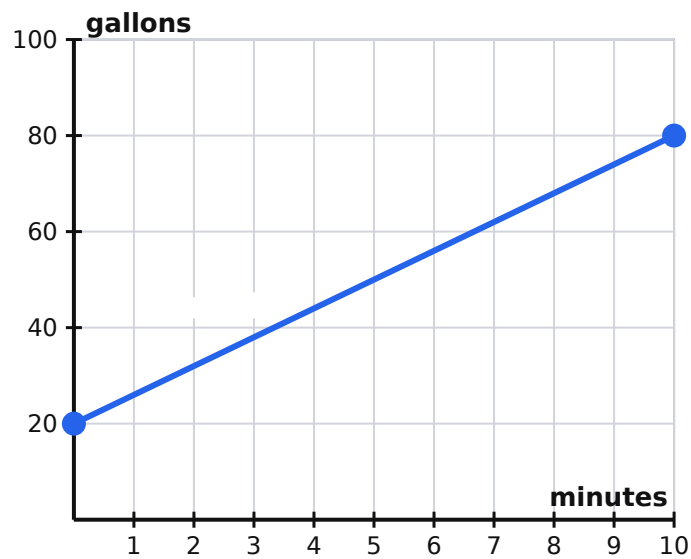
The rule $F = 1.8C + 32$ converts degrees Celsius to degrees Fahrenheit. Find F for $C = 0, 10, 25, 100$. Is the function linear?

Problem 23: Falling object

The height in feet of a dropped ball is $h = 100 - 16t^2$ after t seconds. Find h for $t = 0, 1, 2$ and decide whether the function is linear.

Problem 24: Two tanks

Tank A holds $V = 50 + 4t$ gallons after t minutes. Tank B is graphed through $(0, 20)$ and $(10, 80)$. Which tank has more water at 5 minutes, and which fills faster?



Gallons in tank B over time.