

Grade 8 - Understanding Functions - Answer Key

Common Core 8.F.A.1, 8.F.A.2, 8.F.A.3 · maths-pdf.fr/en/

This answer key gives a full worked solution for each of the 21 problems on the functions worksheet (Common Core 8.F.A.1, 8.F.A.2 and 8.F.A.3). Compare each step with your own work, not only the final answer, and note any step where your method differed.

Grade 8 · Common Core State Standards: **8.F.A.1, 8.F.A.2, 8.F.A.3**

Exercise 1 - Table function

Each x-value appears once with a single y-value.

Yes, it is a function

Exercise 2 - Repeated input

The input 1 has two outputs, 2 and 3.

No, it is not a function

Exercise 3 - Evaluate

$$f(4) = 3 \cdot 4 - 2 = 10.$$

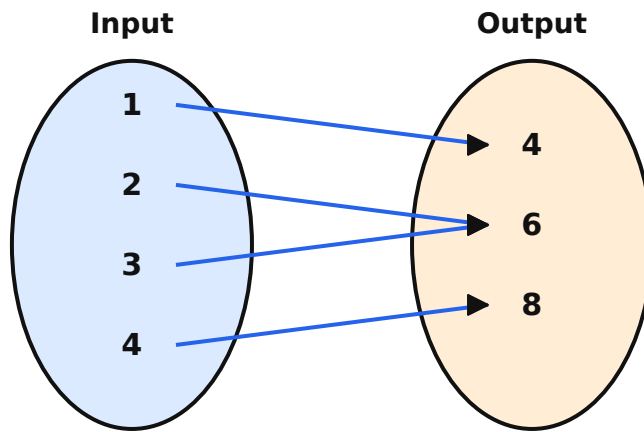
$$f(4) = 10$$

Exercise 4 - Evaluate with a square

$$f(-2) = (-2)^2 + 1 = 4 + 1 = 5.$$

$$f(-2) = 5$$

Exercise 5 - Mapping diagram



Each input has one arrow.

Each input has exactly one arrow. Two inputs (2 and 3) share the output 6, which is allowed.

Yes, it is a function

Exercise 6 - Find the rule

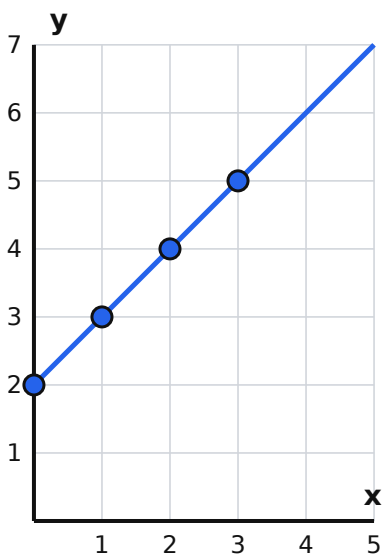
The y-values go up by 2 each time, so $m=2$. When $x=0$, $y=1$, so $b=1$.

$$y=2x+1$$

Exercise 7 - Graph a function

x	0	1	2	3
y	2	3	4	5

Table.



Graph of $y = x + 2$.

Points (0, 2), (1, 3), (2, 4), (3, 5)

Exercise 8 - Compare two functions

A: rate 3, initial value 1. B: rate $5 - 2 = 3$, initial value 2.

Same rate (3); B has the greater initial value (2 versus 1)

Exercise 9 - Graph versus equation

A: rate 2. B: rate $\frac{7-1}{2-0} = 3$.

Function B has the greater rate (3 versus 2)

Exercise 10 - Linear or nonlinear table

The y-values increase by 3, then 5, then 7. The rate of change is not constant.

Nonlinear

Exercise 11 - Linear equation

Rewrite as $y = -2x + 5$, which has the form $y = mx + b$.

Linear; rate -2, initial value 5

Exercise 12 - Which are linear

Linear equations have the form $y = mx + b$: (a) and (d). In (b) the variable is squared and in (c) it is in a denominator.

(a) and (d)

Exercise 13 - Domain and range

Inputs: 1, 2, 3. Outputs: 3, 5, 7.

Domain 1, 2, 3; range 3, 5, 7

Exercise 14 - Solve for the input

$$4x - 3 = 17, \text{ so } 4x = 20.$$

$$x = 5$$

Exercise 15 - Taxi fare function

$$f(6) = 2.5 \cdot 6 + 3 = 18.$$

2.5 is the cost per mile and 3 is the starting fee.

\\$18

Exercise 16 - Is it a function?

Each student has one favorite color, so student to color is a function.

A color can be the favorite of many students, so color to student gives several outputs and is not a function.

Student to color: yes. Color to student: no.

Exercise 17 - Area of a square

$$A(5) = 25 \text{ square units.}$$

The graph is a curve and the rate of change is not constant, so it is nonlinear.

25; nonlinear

Exercise 18 - Phone plans

After 4 months: $A = 5 \cdot 4 + 10 = 30$; $B = 28$. B is cheaper.

After 6 months: $A = 40$; $B = 42$. A is cheaper.

Plan B at 4 months; plan A at 6 months

Exercise 19 - Candle

$$h = 12 - 1.5t, \text{ linear with rate } -1.5.$$

$$6 = 12 - 1.5t, \text{ so } t = 4.$$

$$h = 12 - 1.5t; \text{ linear; after 4 hours}$$

Exercise 20 - Decreasing table

The outputs fall by 2 every time x rises by 2, so the rate is $\frac{-2}{2} = -1$.

$$g(x) = -x + 6.$$

Linear; rate -1; $g(x) = -x + 6$

Exercise 21 - Explain the vertical line

The input 3 would have many outputs (every point on the line), but a function allows only one output for each input.

It fails the vertical line test