



MATH WITH MR DJ

GRADE 8 · FUNCTIONS

WHAT A FUNCTION IS

Today's goal: I can understand that a function is a rule that assigns to each input exactly one output.



Tan



Digit



Blaze



Pi



The definition

- 1 Each INPUT gets exactly ONE output.
- 2 Put 3 in, and you always get the same thing out.

TURN & TALK

Nothing about formulas. Nothing about lines.



WATCH OUT!

Not a function

1 (1,3) (2,5) **(2,8)** (3,7)

2 Input 2 gives 5 AND 8.

DON'T FALL FOR IT

One input, two answers. That is the only way to fail.

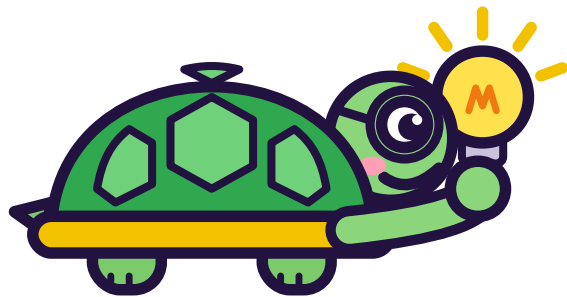


Read it the RIGHT way round

- 1 Each input $\rightarrow$ one output. $\checkmark$
- 2 Each output $\rightarrow$ one input. $\times$ different rule.

REMEMBER

$y = x^2$: both 2 and -2 give 4. Still a function.



BIG IDEA 2

Repeated **OUTPUTS** are fine

- 1 $(1,5) (2,5) (3,5)$ is a function.
- 2 Every input has one output. It is always 5.



BIG IDEA 3

No formula needed

- 1 A table can be a function.
- 2 So can a graph, or a list of pairs.

REMEMBER

“Find the rule” is a different question.



BIG IDEA 4

The vertical line test

- 1 Slide a VERTICAL line across the graph.
- 2 Two crossings at once $\rightarrow$ not a function.

REMEMBER

Vertical, because it asks about one INPUT.



SPOT THE SLIP!

Turn & talk

Digit found a slip...

THE PROBLEM

Is this a function? $(2,7)$ $(3,7)$ $(4,7)$

WHAT A STUDENT DID

Said no because the outputs repeat. This is the backwards reading in its simplest form.

YOUR MISSION

What went wrong? What's the right answer?



Is this a function? $(2,7)$ $(3,7)$ $(4,7)$

- 1 Inputs 2, 3, 4 each appear once.
- 2 The output being 7 every time is irrelevant — repeated outputs are allowed.

Answer: yes



Pick your pepper!



◀ MILD

Is this a function? (5,1)
(6,2) (5,9)

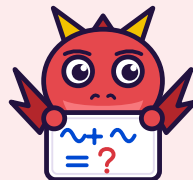
#1 on your practice sheet



◀◀ MEDIUM

Is $y = x^3$ a function? What
about a circle?

#2 on your practice sheet

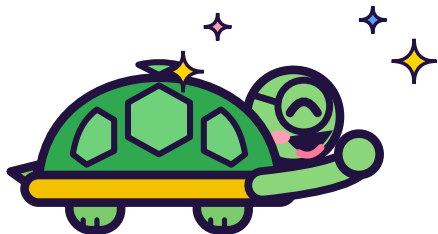


◀◀◀ SPICY

Write the definition of a
function in your own
words.

#5 on your practice sheet

How's it going?



3 • Got it!

I could teach it



2 • Almost

One more example, please



1 • Not yet

I need some help



MATH WITH MR DJ

NOW YOU!

Practice sheet: everyone does Mild & Medium, then climb the peppers.

Stuck? Look back at Mr DJ's example at the top of the sheet.

Need it again? Step-by-step videos on YouTube @MathWithMrDJ

Brain break: 3 new daily puzzles at puzzles.mathwithmrdj.com

