What Is a Function?

Name: _____	Date: _____	Score: _____ / 24

Quick Review

A **function** is a rule that pairs every input with *exactly one* output. Think of a vending machine: press one button (the input) and you always get the same snack (the output). If a single input could give two different outputs, the rule is **not a function**. When a relation is given as a set of ordered pairs (x, y), the x-values are the inputs — if any x shows up twice with *different* y-values, it fails. It is perfectly fine for two different inputs to share the same output, though; that still counts as a function.

◇ **Example:** Is the relation $\{(1,4),\ (2,7),\ (3,7),\ (5,9)\}$ a function?

⇒ Let's check the inputs — the first number in each pair. They are $1, 2, 3$, and 5, and every one of them is different. Since no input is repeated, each input has exactly one output, so this is a function. Notice that 2 and 3 both give the output 7 — that's completely allowed! A function only breaks if the *same input* points to two different outputs.

Answer: function

PRACTICE

Decide whether each relation is a function. Write function *or* not a function.

1. $\{(0,1),\ (1,2),\ (2,3)\}$ _____
2. $\{(4,5),\ (4,6),\ (7,8)\}$ _____
3. $\{(2,9),\ (3,9),\ (4,9)\}$ _____
4. $\{(1,1),\ (2,2),\ (1,3)\}$ _____
5. $\{(-2,5),\ (-1,5),\ (0,5)\}$ _____
6. $\{(5,0),\ (6,1),\ (5,2)\}$ _____
7. $\{(10,3),\ (20,6),\ (30,9)\}$ _____
8. $\{(8,8),\ (8,9)\}$ _____
9. $\{(0,0),\ (1,1),\ (2,4),\ (3,9)\}$ _____
10. $\{(7,2),\ (3,2),\ (7,5)\}$ _____
11. $\{(-3,-1),\ (-2,0),\ (-1,1),\ (0,2)\}$ _____
12. $\{(1,5),\ (2,5),\ (3,5),\ (1,6)\}$ _____
13. $\{(100,1),\ (200,2),\ (300,3)\}$ _____
14. $\{(4,1),\ (5,1),\ (4,1)\}$ _____
15. $\{(-1,2),\ (-1,-2),\ (4,3)\}$ _____
16. $\{(0,7),\ (1,7),\ (2,7),\ (3,7)\}$ _____
17. $\{(2,3),\ (3,4),\ (4,5),\ (3,6)\}$ _____
18. $\{(9,0),\ (8,1),\ (7,2),\ (6,3)\}$ _____
19. $\{(1,1),\ (1,2),\ (1,3),\ (1,4)\}$ _____
20. $\{(-5,25),\ (-4,16),\ (5,25)\}$ _____

Word Problems

21. At a school store, each item has one price: a pencil costs \$1, a notebook costs \$3, and an eraser costs \$1. Write the relation as ordered pairs (item code: pencil $= 1$, notebook $= 2$, eraser $= 3$) and decide if price is a function of the item code. _____

22. A taxi charges by zone. The driver records: zone $1 \to \$8$, zone $2 \to \$12$, zone $1 \to \$10$. Is the fare a function of the zone? Explain. _____

23. A coach pairs each player with a jersey number: Ava $\to 7$, Ben $\to 10$, Cleo $\to 7$. Treating each player as an input, is the jersey number a function of the player? _____

24. A weather log lists the temperature for each hour: hour $1 \to 60°$, hour $2 \to 63°$, hour $2 \to 65°$. Is temperature a function of the hour? _____

Answer Keys

1. function
2. not a function
3. function
4. not a function
5. function
6. not a function
7. function
8. not a function
9. function
10. not a function
11. function
12. not a function
13. function
14. function
15. not a function
16. function
17. not a function
18. function
19. not a function
20. function
21. $\{(1,1),(2,3),(3,1)\}$; function
22. not a function
23. function
24. not a function

Step-by-Step Explanations

1. The inputs $0, 1, 2$ are all different, so each one has exactly one output. That makes it a function.

2. The input 4 appears twice with different outputs (5 and 6), so the rule is not a function.

3. All three inputs are different. Sharing the output 9 is fine, so this is a function.

4. The input 1 shows up with both 1 and 3, so one input gives two outputs — not a function.

5. The inputs $-2, -1, 0$ are distinct, so each has one output. A shared output is allowed: it's a function.

6. The input 5 is paired with both 0 and 2. One input, two outputs — not a function.

7. Every input $(10, 20, 30)$ is different, so each maps to exactly one output. It's a function.

8. The same input 8 gives two different outputs, 8 and 9. That breaks the function rule.

9. The inputs $0, 1, 2, 3$ are all different, so this rule (it's $y = x^2$) is a function.

10. Input 7 pairs with both 2 and 5. A repeated input with different outputs means it is not a function.

11. All four inputs differ, so each has one output. This is a function.

12. Input 1 appears with 5 and again with 6 — two outputs for one input, so it's not a function.

13. The inputs are distinct, so every input has exactly one output. It is a function.

14. Input 4 repeats, but both times it gives the *same* output 1. Same input, same output is fine — it's a function.

15. Input -1 maps to both 2 and -2. That's two outputs for one input, so not a function.

16. Inputs $0, 1, 2, 3$ are all different. Sharing the output 7 is allowed: it's a function.

17. Input 3 is paired with both 4 and 6, so the relation is not a function.

18. Each input $(9, 8, 7, 6)$ is distinct, so each has exactly one output. This is a function.

19. The single input 1 is paired with four different outputs. One input cannot give many outputs — not a function.

20. The inputs $-5, -4, 5$ are all different. Two of them share the output 25, which is allowed — it's a function.

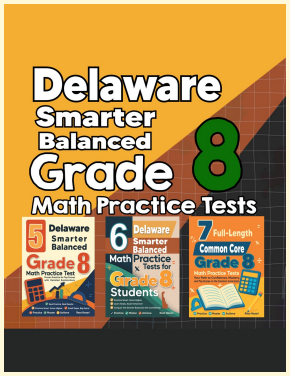
21. The item codes $1, 2, 3$ are all different inputs, so each item has exactly one price. The pencil and eraser sharing a $1 price is fine — price *is* a function of the item code.

22. Zone 1 shows up twice with two different fares, $8 and $10. Since one input (zone 1) gives two outputs, the fare is not a function of the zone.

23. The inputs Ava, Ben, and Cleo are three different players, so each has exactly one jersey number. Ava and Cleo sharing the number 7 is allowed — it's a function.

24. Hour 2 is recorded with two different temperatures, $63°$ and $65°$. The same input cannot have two outputs, so temperature is not a function of the hour here.

Want Even More Practice? Check Out Our Other Delaware DeSSA Test Books!



Delaware DeSSA Grade 8 Math Preparation Bundle

18 full-length practice tests across three books
(5 + 6 + 7)
No repeated questions—maximum practice value!

18 Tests!
3 Books
One Bundle

Important: All our test books contain **unique, completely different tests** from each other! Each book offers fresh practice questions—no repeats!

5 Practice Tests

- ✓ 5 complete practice tests with detailed explanations
- ✓ Perfect foundation for DeSSA test preparation
- ✓ Builds confidence and test-taking skills
- ✓ High-quality questions aligned with state standards

Start your practice journey!

6 Practice Tests

- ✓ 6 complete practice tests with detailed explanations
- ✓ **Unique tests**—different from the 5 tests book
- ✓ Perfect for more practice after mastering 5 tests
- ✓ Builds even more confidence and test-taking skills
- ✓ Same high-quality questions aligned with standards

Take your practice to the next level!

7 Practice Tests

- ✓ 7 complete practice tests for maximum preparation
- ✓ **Unique tests**—different from 5 and 6 tests books
- ✓ The most comprehensive practice for Grade 8
- ✓ Ideal for students aiming for top scores
- ✓ Extensive practice builds mastery and confidence

Go all the way with comprehensive practice!