1.6 Represent Functions as Rules and Tables

Goal • Represent functions as rules and as tables.

Your Notes

VOCABULARY

Function A rule that establishes a relationship between two quantities, called the input and the output. For each input, there is exactly one output

Domain The collection of all input values

Range The collection of all output values

Independent variable The input variable

Dependent variable The output variable

Example 1 *Identify the domain and range of a function*

The input-output table shows temperatures over various increments of time. Identify the domain and range of the function.

Input (hours)	0	2	4	6
Output (°C)	24	27	30	33

Solution

Domain: 0, 2, 4, 6

Range: 24, 27, 30, 33

Your Notes

✔ ***Checkpoint*** **Identify the domain and range of the function.**

1.

Input	4	7	11	13
Output	10	20	35	45

Domain: 4, 7, 11, 13

Range: 10, 20, 35, 45

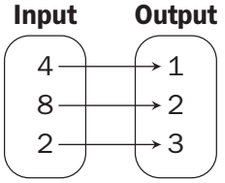
Example 2 ***Identify a function***

Tell whether the pairing is a function. Explain your reasoning.

Solution

Mapping diagrams are often used to represent functions. Take note of the pairings to make your decision.

a.



The pairing is a function because each input is paired with exactly one output.

b.

Input	**Output**
2	2
2	4
3	6
4	8

The pairing is not a function because the input 2 is paired with 2 and 4.

✔ ***Checkpoint*** **Tell whether the pairing is a function.**

2.

Input	5	5	10	15
Output	3	4	6	8

No, the pairing is not a function.

3.

Input	0	4	12	20
Output	3	5	9	13

Yes, the pairing is a function.

Your Notes

A function may be represented using a rule that relates one variable to another.

FUNCTIONS

Verbal Rule

The output is 2 less than the input.

Equation

$y = x - 2$

Table

Input	2	4	6	8	10
Output	0	2	4	6	8

Example 3 *Make a table for a function*

The domain of the function $y = 3x$ is 0, 1, 2, and 3. Make a table for the function, then identify the range of the function.

Solution

x	0	1	2	3
$y = 3x$	$3(0) = 0$	$3(1) = 3$	$3(2) = 6$	$3(3) = 9$

The range of the function is 0, 3, 6, and 9 .

Example 4 *Write a function rule*

Write a rule for the function.

Input	3	5	7	9	11
Output	6	10	14	18	22

Solution

Let x be the input and let y be the output. Notice that each output is twice the corresponding input. So, a rule for the function is $y = 2x$.

Homework

✔ ***Checkpoint*** **Write a rule for the function. Identify the domain and the range.**

4.

Yarn (yd)	1	2	3	4
Total Cost ($)	1.5	3	4.5	6

Function Rule: $y = 1.5x$

Domain: 1, 2, 3, 4 Range: 1.5, 3, 4.5, 6