EXAMPLE 1 Identify the domain and range of a function

The input-output table shows the cost of various amounts of regular unleaded gas from the same pump. Identify the domain and range of the function.

Input (gallons)	10	12	13	17
Output (dollars)	19.99	23.99	25.99	33.98

ANSWER

The domain is the set of inputs: 10, 12, 13, and 17. **The range is the set of outputs:** 19.99, 23.99, 25.99, **and** 33.98.

GUIDED PRACTICE for Example 1

1. Identify the domain and range of the function.

Input	0	1	2	4
Output	5	2	2	1

SOLUTION

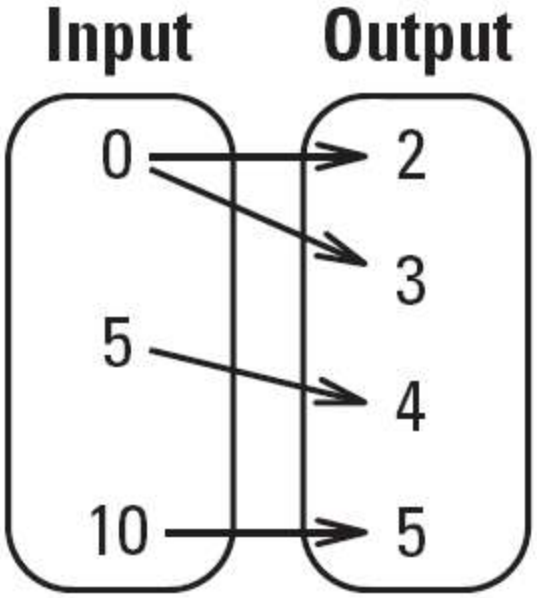
The domain is the set of inputs: 0, 1, 2, and 4

The range is the set of outputs: 1, 2, and 5

EXAMPLE 2 Identify a function

Tell whether the pairing is a function.

a.



The pairing is *not* a function because the input 0 is paired with both 2 and 3.

EXAMPLE 2 Identify a function

b.

Input	Output
0	0
1	2
4	8
6	12

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

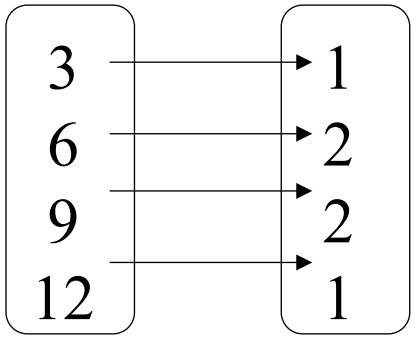
GUIDED PRACTICE for Example 2

Tell whether the pairing is a function.

2.

Input	3	6	9	12
Output	1	2	2	1

SOLUTION



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

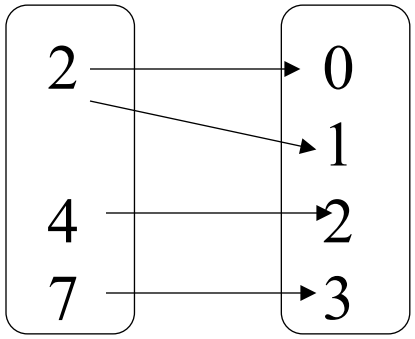
GUIDED PRACTICE for Example 2

Tell whether the pairing is a function.

3.

Input	2	2	4	7
Output	0	1	2	3

SOLUTION



The pairing is not a function because each input is not paired with exactly one output.

EXAMPLE 3 Make a table for a function

The domain of the function $y = 2x$ **is** $0, 2, 5, 7,$ **and** $8.$ **Make a table for the function, then identify the range of the function.**

SOLUTION

x	0	2	5	7	8
$y = 2x$	$2(0) = 0$	$2(2) = 4$	$2(5) = 10$	$2(7) = 14$	$2(8) = 16$

The range of the function is $0, 4, 10, 14,$ **and** $16.$

EXAMPLE 4 Write a function rule

Write a rule for the function.

Input	0	1	4	6	10
Output	2	3	6	8	12

SOLUTION

Let x be the input, or independent variable, and let y be the output, or dependent variable. Notice that each output is 2 more than the corresponding input. So, a rule for the function is $y = x + 2$.

EXAMPLE 5 Write a function rule for a real-world situation

Concert Tickets

You are buying concert tickets that cost $15 each. You can buy up to 6 tickets. Write the amount (in dollars) you spend as a function of the number of tickets you buy.Identify the independent and dependent variables.Then identify the domain and the range of the function.

EXAMPLE 5 Write a function rule for a real-world situation

SOLUTION

Write a verbal model. Then write a function rule. Let n represent the number of tickets purchased and A represent the amount spent (in dollars).

Amount spent (dollars)	=	Cost per ticket (dollars/ticket)	•	Tickets purchased (tickets)
A	=	15	•	n

So, the function rule is $A = 15n$. The amount spent depends on the number of tickets bought, so n is the independent variable and A is the dependent variable.

EXAMPLE 5 Write a function rule for a real-world situation

Because you can buy up to 6 tickets, the domain of the function is 0, 1, 2, 3, 4, 5, and 6. Make a table to identify the range.

Number of tickets, n	0	1	2	3	4	5	6
Amount (dollars), A	0	15	30	45	60	75	90

The range of the function is 0, 15, 30, 45, 60, 75, and 90.

GUIDED PRACTICE for Examples 3,4 and 5

4. Make a table for the function $y - x = 5$ with domain $10, 12, 15, 18,$ and 29. Then identify the range of the function.

SOLUTION

x	10	12	15	18	
y- x = 5	10 – 5 =5	12 – 5 =7	15 – 5 =10	18 – 5 =13	18 –

The range of the function is $5,7,10,13$ and 24.

GUIDED PRACTICE for Examples 3,4 and 5

5. Write a rule for the function. Identify the domain and the range.

Time (hours)	1	2	3	4
Pay (dollars)	8	16	24	32

SOLUTION

Let x **be the input ,or independent variable and let** y **be the output, or dependent variable.Notice that each output is** 8 **times more than corresponding input .**
So as a rule of function $y = 8x;$
domain 1, 2, 3 **and** 4**;**
range 8, 16, 24 **and** 32**.**