

# What Is a Function?

A relation is a rule that takes input values and assigns them to output values. A relation is a **function** if every input value has exactly one output value. You can represent relations with sets of ordered pairs, mappings, and tables.

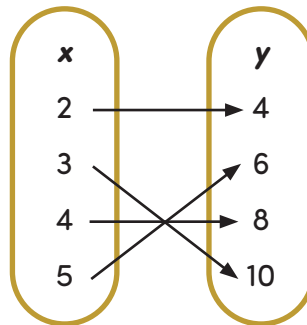
**Let's try it!** Determine if the two relations below are functions.

**Relation A:**

**Ordered pairs:**

(2, 4), (3, 10), (4, 8), (5, 6)

**Mapping:**



**Table:**

x	y
2	4
3	10
4	8
5	6

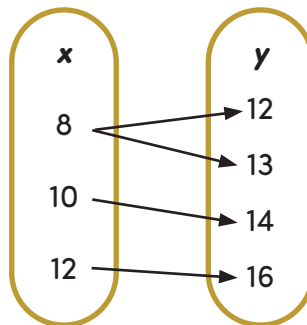
Every input, or x-value, has exactly one output, or y-value. So, this relation is a function.

**Relation B:**

**Ordered pairs:**

(8, 12), (10, 14), (8, 13), (12, 16)

**Mapping:**



**Table:**

x	y
8	12
10	14
8	13
12	16

The input value 8 has two output values. So, this relation is **not** a function.

**Time to practice!** Determine if each relation is a function. Circle the correct answer.

(3, 1), (9, 3), (21, 7), (27, 9)

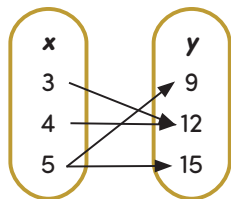
Is this relation a function? **Yes** No

(2, -3), (3, -2), (4, -3), (5, -1)

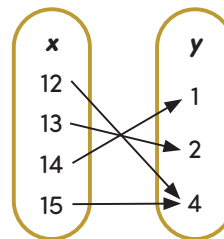
Is this relation a function? **Yes** No

# What Is a Function?

**Keep going!** Determine if each relation is a function. Circle the correct answer.



Is this relation a function? Yes  No



Is this relation a function? Yes  No

<b>x</b>	60	58	64	58
<b>y</b>	-19	12	14	-12

Is this relation a function? Yes  No

<b>x</b>	80	64	48	32
<b>y</b>	10	8	6	4

Is this relation a function? Yes  No

**Challenge!** In each row below, you are given the same incomplete relation twice. Follow the directions to make a relation that is a function or not a function. **Answers will vary**

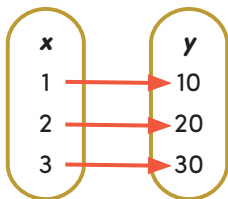
Add a new ordered pair so that the relation is a function.

(3, 4), (5, 6), (7, 8), ( 9 , 10 )

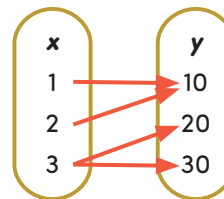
Add a new ordered pair so that the relation is **not** a function.

(3, 4), (5, 6), (7, 8), ( 7 , 9 )

Draw arrows to make a relation that is a function.



Draw arrows to make a relation that is **not** a function.



Complete the table so that the relation is a function.

<b>x</b>	70	60	50	<b>40</b>
<b>y</b>	15	20	25	<b>30</b>

Complete the table so that the relation is **not** a function.

<b>x</b>	70	60	50	<b>50</b>
<b>y</b>	15	20	25	<b>30</b>