# Functions

1. Can the table shown below represent values of a function? Explain.

| Input $(x)$ | 9 | 8 | 7 | 8 | 9 |
|---|---|---|---|---|---|
| Output $(y)$ | 11 | 15 | 19 | 24 | 28 |

2. Olivia examined the table of values shown below and stated that a possible rule to describe this function could be $y = -2x + 9$. Is she correct? Explain.

| Input $(x)$ | $-4$ | 0 | 4 | 8 | 12 | 16 | 20 | 24 |
|---|---|---|---|---|---|---|---|---|
| Output $(y)$ | 17 | 9 | 1 | $-7$ | $-15$ | $-23$ | $-31$ | $-39$ |

3. Peter said that the set of data in part (a) describes a function, but the set of data in part (b) does not. Do you agree? Explain why or why not.

a.

| Input $(x)$ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Output $(y)$ | 8 | 10 | 32 | 6 | 10 | 27 | 156 | 4 |

b.

| Input $(x)$ | $-6$ | $-15$ | $-9$ | $-3$ | $-2$ | $-3$ | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| Output $(y)$ | 0 | $-6$ | 8 | 14 | 1 | 2 | 11 | 41 |

# Functions

1. Can the table shown below represent values of a function? Explain.

| Input $(x)$ | 9 | 8 | 7 | 8 | 9 |
|---|---|---|---|---|---|
| Output $(y)$ | 11 | 15 | 19 | 24 | 28 |

*No, the table cannot represent a function because the input of $9$ has two different outputs, and so does the input of $8$. Functions assign only one output to each input.*

2. Olivia examined the table of values shown below and stated that a possible rule to describe this function could be $y = -2x + 9$. Is she correct? Explain.

| Input $(x)$ | $-4$ | 0 | 4 | 8 | 12 | 16 | 20 | 24 |
|---|---|---|---|---|---|---|---|---|
| Output $(y)$ | 17 | 9 | 1 | $-7$ | $-15$ | $-23$ | $-31$ | $-39$ |

*Yes, Olivia is correct. When the rule is used with each input, the value of the output is exactly what is shown in the table. Therefore, the rule for this function could well be $y = -2x + 9$.*

3. Peter said that the set of data in part (a) describes a function, but the set of data in part (b) does not. Do you agree? Explain why or why not.

a.

| Input $(x)$ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Output $(y)$ | 8 | 10 | 32 | 6 | 10 | 27 | 156 | 4 |

b.

| Input $(x)$ | $-6$ | $-15$ | $-9$ | $-3$ | $-2$ | $-3$ | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| Output $(y)$ | 0 | $-6$ | 8 | 14 | 1 | 2 | 11 | 41 |

*Peter is correct. The table in part (a) fits the definition of a function. That is, there is exactly one output for each input. The table in part (b) cannot be a function. The input $-3$ has two outputs, $14$ and $2$. This contradicts the definition of a function; therefore, it is not a function.*