Key Idea

Functions as Equations

A **function rule** is an equation that describes the relationship between inputs (independent variable) and outputs (dependent variable).

Input $\xrightarrow{-2}$ Function Rule: $y = 3x$ $\xrightarrow{-6}$ Output

Remember

An independent variable represents a quantity that can change freely. A dependent variable depends on the independent variable.

Writing Function Rules

Ex:) Write a function rule for the given statements.   Notes:

A. "The output is five less than the input."

B. "The output is the square of the input."

OYO:) Write a function rule for the given statement.   Notes:

Write a function rule for "The output is one-fourth of the input."

Evaluating a Function

Ex:) What is the value of $y = 2x + 5$ when $x = 3$?   Notes:

Find the value of y when $x = 5$.

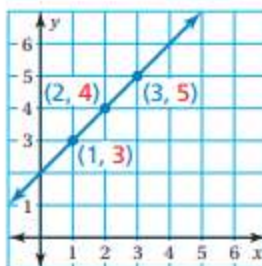OYO:) What is the value of $y = 10x$ when $x = -2$?

Find the value of y when $x = -7.5$

🔑 Key Idea

Functions as Tables and Graphs

A function can be represented by an input-output table and by a graph.
The table and graph below represent the function $y = x + 2$.

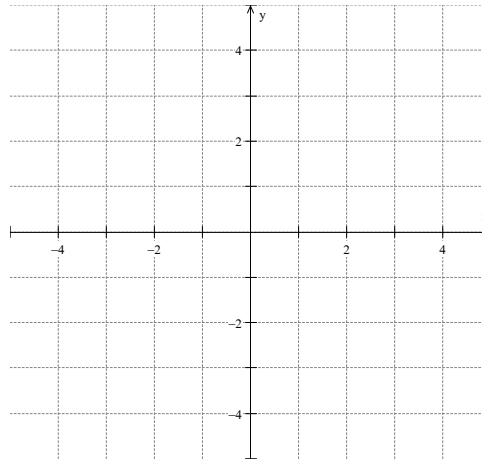| Input, x	Output, y	Ordered Pair, (x, y)
1	3	(1, 3)
2	4	(2, 4)
3	5	(3, 5)

By drawing a line through the points, you graph *all* of the solutions
of the function $y = x + 2$.

Graphing a Function
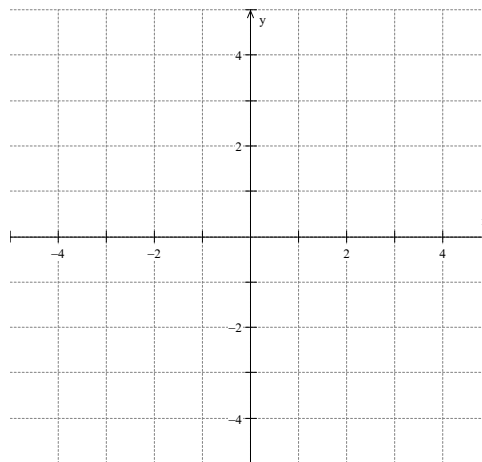
EX:) Graph the function $y = -2x + 1$.   Notes:

OYO:) Graph the function $y = 3x + 2$.   Notes:
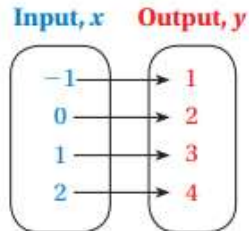
Summary

Representations of Functions

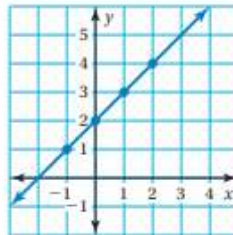**Words**   The output is 2 more than the input.

Equation $y = x + 2$

| Input-Output Table | | Mapping Diagram | Graph |

Input-Output Table

Input, x	Output, y
−1	1
0	2
1	3
2	4

Mapping Diagram

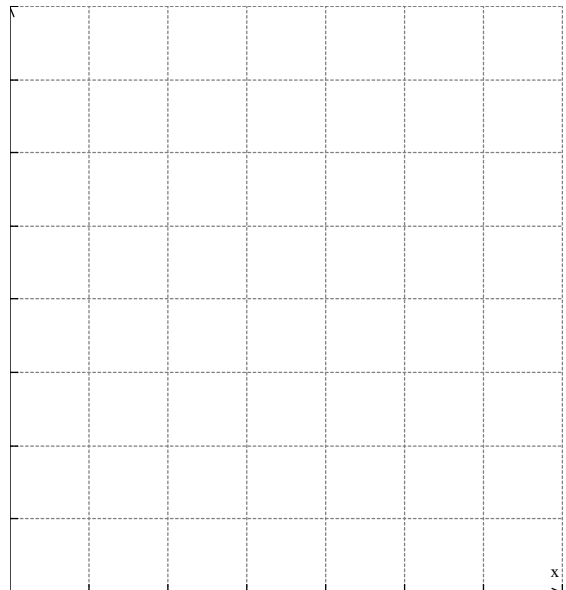| Input, x	Output, y
−1	1
0	2
1	3
2	4

Graph

Modeling Real Life

Ex:) A car produces 20 pounds of carbon dioxide for every gallon of gasoline burned. Write and graph a function that describes the relationship.

Notes:

OYO:) The World Health Organization (WHO) suggests having 23 health-care 〔Notes:〕
workers for every 10,000 people. How many health-care workers are needed
to meet the WHO suggestion for a population of 250,000 people?
 Justify your answer using a graph.