LESSON MAKER PRO

Inputs in Action

Read functions and decide which values make sense.

HIGH SCHOOL · A1.F.1.2

A1.F.1.2 "Identify the dependent variable, independent variable, domain and range given a function, equation, or graph. Identify restrictions on the domain and range in mathematical models."

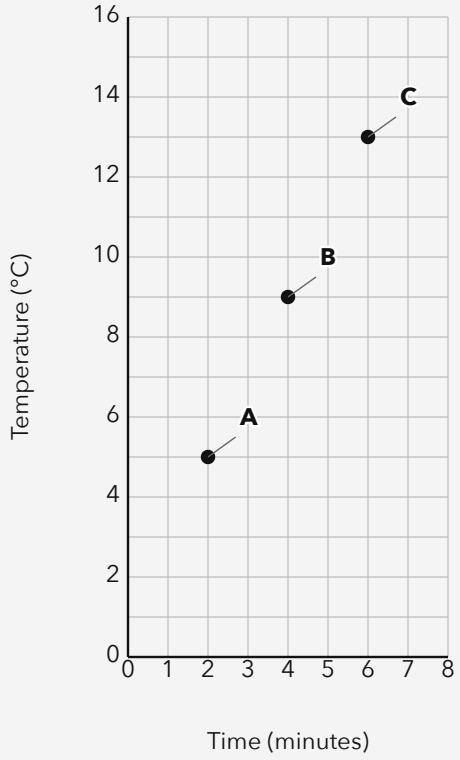
NAME _____ DATE _____

INPUTS AND OUTPUTS

The independent variable is the input, and the dependent variable changes with it. On a graph, the domain is the set of horizontal values and the range is the set of vertical values. In a real-world model, include only values the situation allows.

WORKED EXAMPLE

Each dot shows a temperature measurement. Use only the plotted dots to identify the independent variable, dependent variable, domain, and range.

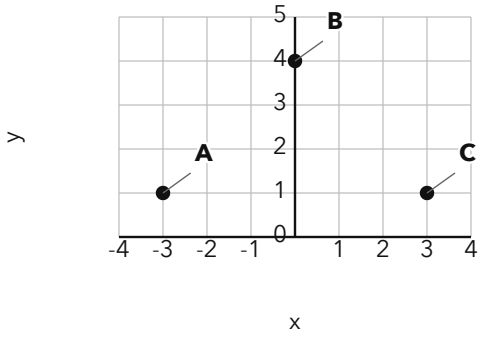


1. Read the horizontal axis: time is the input.
2. Read the vertical axis: temperature is the output.
3. List the horizontal coordinates of the dots: 2, 4, 6.
4. List the vertical coordinates of the dots: 5, 9, 13.

Answer: Independent variable: time; dependent variable: temperature; domain: {2, 4, 6}; range: {5, 9, 13}.

PRACTICE 6 problems

1 Use only the plotted points. What are the domain and range?



ANSWER _____

2 For y = 3x - 2 with domain {1, 3, 5}, find the range.

ANSWER _____

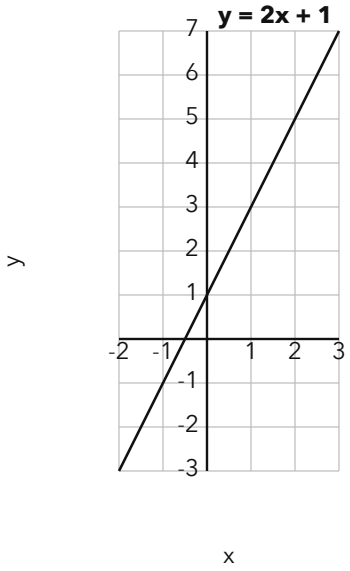
3 The cost C of buying n digital stickers is C = 8n + 2. Identify the independent and dependent variables.

ANSWER _____

4 A game starts you with 12 energy points. You lose 2 points after each level, so y = 12 - 2x, where x is the number of levels completed. You can complete at most 6 levels. What are the domain and range?

ANSWER _____

5 The graph shows y = 2x + 1. If -1 ≤ x ≤ 2, what are the domain and range?



ANSWER _____

6 Share 18 pizza slices equally among x friends, with no leftovers. Each friend gets y = 18/x whole slices. What are the domain and range?

ANSWER _____

APPLY IT Show your work

1 A streaming service charges a $6 monthly fee plus $4 per movie rental. You have at most $26 to spend this month. Let r be the number of rentals and C be the total cost. Identify the independent and dependent variables, then give the domain and range.

WORK SPACE

ANSWER _____

2 While you stream video, your phone's battery percentage is modeled by B = 100 - 25h, where h is the number of hours streamed. Streaming may last for any fraction of an hour and stops when the battery reaches 0%. Identify the independent and dependent variables, then give the domain and range.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A function is given by $y = x^2 - 4$, where x is an integer from -3 through 3. A student says the range contains every integer from -4 through 5. Explain why this is incorrect, and give the correct range.

WORK SPACE AND ANSWER

ANSWER KEY

Inputs in Action

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use only the plotted points. What are the domain and range?	**Domain: {-3, 0, 3}; range: {1, 4}.**
2	For y = 3x - 2 with domain {1, 3, 5}, find the range.	**{1, 7, 13}**
3	The cost C of buying n digital stickers is C = 8n + 2. Identify the independent and dependent variables.	**Independent variable: n, the number of stickers; dependent variable: C, the cost.**
4	A game starts you with 12 energy points. You lose 2 points after each level, so y = 12 - 2x, where x is the number of levels completed. You can complete at most 6 levels. What are the domain and range?	**Domain: {0, 1, 2, 3, 4, 5, 6}; range: {0, 2, 4, 6, 8, 10, 12}.**
5	The graph shows y = 2x + 1. If -1 ≤ x ≤ 2, what are the domain and range?	**Domain: -1 ≤ x ≤ 2; range: -1 ≤ y ≤ 5.**
6	Share 18 pizza slices equally among x friends, with no leftovers. Each friend gets y = 18/x whole slices. What are the domain and range?	**Domain: {1, 2, 3, 6, 9, 18}; range: {1, 2, 3, 6, 9, 18}.**

PART 2 · APPLY IT

1. **Independent variable: r, the number of rentals; dependent variable: C, the total cost. Domain: {0, 1, 2, 3, 4, 5}; range: {$6, $10, $14, $18, $22, $26}.** Use C = 6 + 4r and solve 6 + 4r ≤ 26. Because rentals come in whole numbers, r can be any integer from 0 through 5.
2. **Independent variable: h, hours streamed; dependent variable: B, battery percentage. Domain: 0 ≤ h ≤ 4; range: 0 ≤ B ≤ 100.** Solve 100 - 25h = 0 to find that the battery reaches 0% at h = 4. Fractional hours are allowed, so both intervals include all values between their endpoints.

CHALLENGE

The range skips some integers because squaring the allowed inputs does not produce every integer from 0 through 9. The correct range is {-4, -3, 0, 5}.

Accept domain and range sets in any order. For interval answers, accept equivalent interval notation.