

Function Input Check

Read, evaluate, and explain function notation.

HIGH SCHOOL • AI-F.IF.2

AI-F.IF.2 "Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context."

NAME _____

DATE _____

FUNCTION NOTATION

A function gives exactly one output for each allowed input. To evaluate $f(a)$, replace x with a and simplify. A statement such as $f(a) = b$ says that input a has output b , so connect each value to its meaning in a context.

WORKED EXAMPLE

Evaluate $g(6)$ for $g(x) = 3x - 4$.

1. Start with $g(x) = 3x - 4$.
2. Replace x with 6: $g(6) = 3(6) - 4$.
3. Multiply: $g(6) = 18 - 4$.
4. Subtract: $g(6) = 14$.

Answer: $g(6) = 14$

PRACTICE 6 problems

- 1** Evaluate $f(5)$ for $f(x) = 2x + 7$.

ANSWER _____

- 2** Evaluate $h(-2)$ for $h(x) = x^2 + 8$.

ANSWER _____

- 3** A music-streaming app models the total monthly cost in dollars by $M(n) = 20 + 9n$, where n is the number of premium add-ons. Find $M(7)$. Then tell what the result means.

ANSWER _____

- 4** For a function r , $r(-5) = 11$. What is the input, and what is the output?

ANSWER _____

- 5** Evaluate $q(8)$ for $q(x) = (x + 10)/2$.

ANSWER _____

- 6** The function $P(t) = 100 - 12t$ gives the percent of a phone battery remaining t hours after it is unplugged. Find $P(7)$ and interpret the result.

ANSWER _____

APPLY IT Show your work

- 1** A gaming platform charges a \$21 membership fee plus \$5 for each add-on pack. The total cost in dollars is $C(g) = 21 + 5g$, where g is the number of add-on packs. Find $C(5)$ and explain what it means.

WORK SPACE

ANSWER _____

- 2** During a study session, $B(t)$ gives the percent of a laptop battery remaining after t hours. Use the table to find $B(8)$ and interpret it.

LAPTOP BATTERY

t, hours	B(t), percent
2	88
5	70
8	52
11	34

ANSWER _____

CHALLENGE One step up

The function $R(x) = (x^2 - 25)/(x - 5)$ has a domain that excludes $x = 5$. A student simplifies the expression to $x + 5$ and claims that $R(5) = 10$. Is the claim correct? Explain your reasoning.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Evaluate $f(5)$ for $f(x) = 2x + 7$.	$f(5) = 17$
2	Evaluate $h(-2)$ for $h(x) = x^2 + 8$.	$h(-2) = 12$
3	A music-streaming app models the total monthly cost in dollars by $M(n) = 20 + 9n$, where n is the number of premium add-ons. Find $M(7)$. Then tell what the result means.	$M(7) = 83$. Seven premium add-ons make the monthly cost \$83.
4	For a function r , $r(-5) = 11$. What is the input, and what is the output?	Input: -5. Output: 11.
5	Evaluate $q(8)$ for $q(x) = (x + 10)/2$.	$q(8) = 9$
6	The function $P(t) = 100 - 12t$ gives the percent of a phone battery remaining t hours after it is unplugged. Find $P(7)$ and interpret the result.	$P(7) = 16$. After 7 hours, 16% of the battery remains.

PART 2 • APPLY IT

- $C(5) = 46$. Five add-on packs cost \$46 total.** Substitute 5 for g : $C(5) = 21 + 5(5) = 46$. State that the output is the total cost in dollars.
- $B(8) = 52$. After 8 hours, the laptop battery is at 52%.** Read the row where $t = 8$. The corresponding output is 52 percent.

CHALLENGE

No. $R(5)$ is undefined because substituting 5 makes the denominator 0. Simplifying to $x + 5$ does not add 5 to the original domain.

Accept equivalent numerical forms and context statements that correctly name the input and output units. For the challenge, require that students identify division by zero and preserve the original domain restriction.