LESSON MAKER PRO

Where Graphs Live

Read the inputs a graph or situation allows.

HIGH SCHOOL · A1P.AF.E.15.b

A1P.AF.E.15.b "Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. Limit to linear, quadratic, exponential, and absolute value functions."

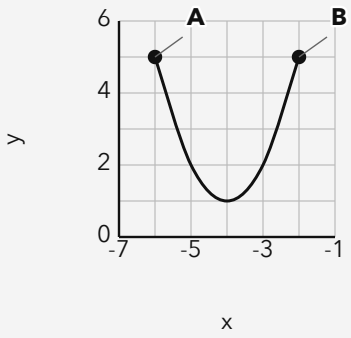
NAME _____ DATE _____

FINDING THE DOMAIN

The domain is the set of allowed input values. On a graph, read the x-values it covers. A real situation may limit those values or allow only separate inputs.

WORKED EXAMPLE

Find the domain of the graphed portion. Both marked endpoints are included.



1. The leftmost x-value is -6, and the rightmost is -2.
2. The curve covers every x-value between them. Both endpoints count.

Answer: -6 ≤ x ≤ -2

PRACTICE 4 problems

1 For f(x) = 3x + 1, use only 2 ≤ x < 7. State the domain. Which endpoint is included on the graph?

ANSWER _____

2 For g(x) = |x - 4|, use only x ≥ -3. State the domain. Which way does the graph continue without end?

ANSWER _____

3 The graph of p(x) = x^2 + 9 continues without end in both horizontal directions. State its domain. Does it have an endpoint?

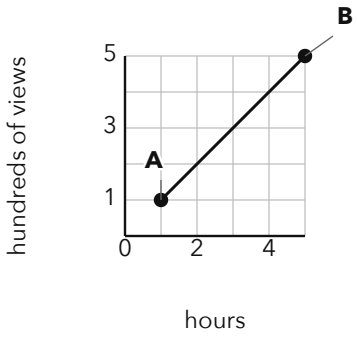
ANSWER _____

4 For q(x) = 2^x, use only x = 1, 3, or 5. List the domain. Is its graph continuous or made of separate points?

ANSWER _____

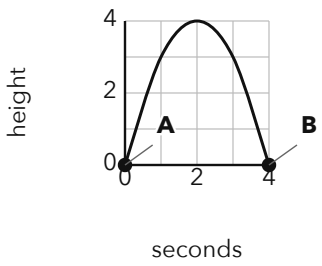
APPLY IT Show your work

1 A creator models a video's views over the time shown. x is hours since posting. Find the model's domain. What does its left endpoint mean?



ANSWER _____

2 A game character jumps and lands as shown. x is seconds since the jump began. Find the model's domain. What does its right endpoint mean?



ANSWER _____

CHALLENGE One step up

A game character's height during a jump is $h(x) = -x^2 + 8x$, where x is seconds since the jump began. The model stops when the character lands. Find the domain and explain why $x = 9$ is excluded.

WORK SPACE AND ANSWER

Where Graphs Live

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For f(x) = 3x + 1, use only 2 ≤ x < 7. State the domain. Which endpoint is included on the graph?	**2 ≤ x < 7; the left endpoint is included.**
2	For g(x) = |x - 4|, use only x ≥ -3. State the domain. Which way does the graph continue without end?	**x ≥ -3; the graph continues to the right.**
3	The graph of $p(x) = x^2 + 9$ continues without end in both horizontal directions. State its domain. Does it have an endpoint?	**All real numbers; it has no endpoint.**
4	For $q(x) = 2^x$, use only x = 1, 3, or 5. List the domain. Is its graph continuous or made of separate points?	**{1, 3, 5}; separate points.**

PART 2 · APPLY IT

1. **1 ≤ x ≤ 5; the model starts 1 hour after posting.** Read the x-values from the first plotted endpoint to the last, including both.
2. **0 ≤ x ≤ 4; the character lands 4 seconds after jumping.** The graph covers all times from x = 0 through its right endpoint at x = 4.

CHALLENGE

0 ≤ x ≤ 8. The jump begins at x = 0, and h(x) = x(8 - x) returns to 0 at x = 8. At x = 9, the formula gives a negative height, after the character has landed.

Accept interval notation for continuous domains and equivalent wording for endpoint meanings. For problem 4, accept only the three listed inputs, not the interval from 1 to 5.