LESSON MAKER PRO

Which Inputs Work?

Find domains from graphs and real situations

GRADE 8 · 8A.AF.F.16.b

8A.AF.F.16.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."

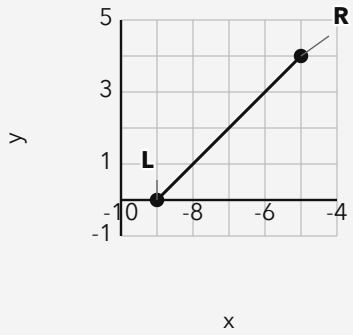
NAME _____ DATE _____

FIND THE ALLOWED INPUTS

The domain is the set of x-values a function can use. On a graph with included endpoints, read the x-values from the left endpoint to the right endpoint. In a real situation, decide whether inputs between the endpoints can be fractions or must be whole numbers.

WORKED EXAMPLE

The graph includes both labeled endpoints. Write its domain as an inequality.

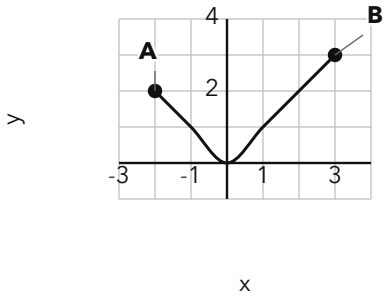


1. The left endpoint L has x = -9.
2. The right endpoint R has x = -5.
3. The graph includes both endpoints and every x-value between them.

Answer: -9 <= x <= -5

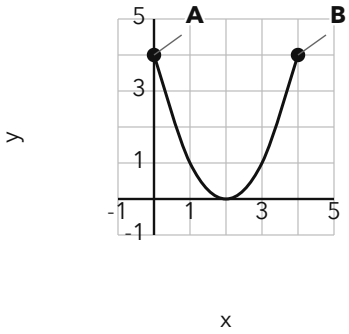
PRACTICE 6 problems

1 The graph includes both labeled endpoints. Write its domain as an inequality.



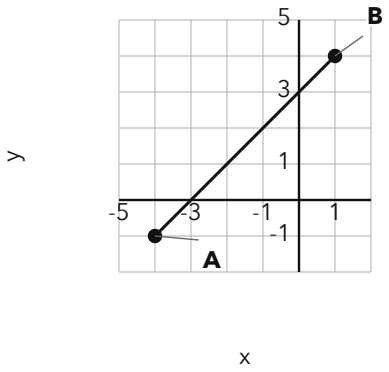
ANSWER _____

2 The graph includes both labeled endpoints. Write its domain as an inequality.



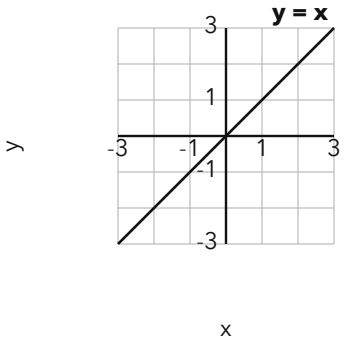
ANSWER _____

3 The graph includes both labeled endpoints. Is x = -2 allowed? Is x = 2 allowed? Give the domain.



ANSWER _____

4 The line continues beyond the grid in both directions. What is its domain?



ANSWER _____

5 The table lists every allowed input for this function. Write its domain as a set.

ALLOWED INPUTS AND OUTPUTS

x	y
-3	9
0	0
2	4
6	36

ANSWER _____

6 For y = |x - 1|, only inputs greater than -1 and at most 5 are allowed. Write the domain as an inequality.

ANSWER _____

APPLY IT Show your work

1 A game offers a 12-hour free trial. Let x be the number of hours you have played, and let y = 12 - x be the hours left. You can play for part of an hour. Give the domain of x and explain why x = 13 is not in it.

WORK SPACE

ANSWER _____

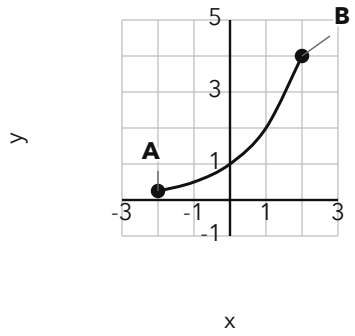
2 Your school's talent show has 24 seats. Let x be the number of tickets sold, and let y = 24 - x be the seats left. Give the domain of x. Are all numbers between its endpoints allowed?

WORK SPACE

ANSWER _____

CHALLENGE One step up

The graph shows only the drawn portion of $y = 2^x$, including both labeled endpoints. A student says its domain is all real numbers because 2^x can use any real x. Explain why that does not match this graph, and give the domain of the drawn portion.



WORK SPACE AND ANSWER

ANSWER KEY

Which Inputs Work?

GRADE 8 · 8A.AF.F.16.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The graph includes both labeled endpoints. Write its domain as an inequality.	**-2 <= x <= 3**
2	The graph includes both labeled endpoints. Write its domain as an inequality.	**0 <= x <= 4**
3	The graph includes both labeled endpoints. Is x = -2 allowed? Is x = 2 allowed? Give the domain.	**x = -2 is allowed; x = 2 is not. The domain is -4 <= x <= 1.**
4	The line continues beyond the grid in both directions. What is its domain?	**All real numbers**
5	The table lists every allowed input for this function. Write its domain as a set.	**{-3, 0, 2, 6}**
6	For y = |x - 1|, only inputs greater than -1 and at most 5 are allowed. Write the domain as an inequality.	**-1 < x <= 5**

PART 2 · APPLY IT

1. **0 <= x <= 12, including fractional hours. x = 13 is not in the domain because the trial ends after 12 hours.** Elapsed time begins at 0 and can reach 12 hours. Fractional hours are possible, but 13 hours exceeds the trial.
2. **x is a whole number with 0 <= x <= 24. No, fractional numbers of tickets are not allowed.** The number sold can be any whole number from 0 through 24. The formula gives an output for fractions, but a fraction of a ticket cannot be sold in this situation.

CHALLENGE

The drawn graph stops at x = -2 and x = 2, so it does not show inputs outside those endpoints. Its domain is -2 <= x <= 2.

Accept interval notation for continuous domains. For the talent show, an answer must specify whole numbers, not just the inequality.