

Algebra 1
Finding Inputs from Function Outputs

Inverse Functions and Reverse Lookup | A1-U04-P05

96 problems · Four activity formats

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Topic focus
Across 96 tasks this topic asks for all admissible inputs with justification.
8 PDFs and a README; 80 buyer pages.

Algebra 1

Finding Inputs from Function Outputs

Name: _____ Date: _____ Class: _____

Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. A value without its unit is not a complete answer.

Retain only positive inputs. The supplied candidate inputs are $(0, 5)$. The declared domain is $x > 0$. The target output is 1.	Simplify candidates, then impose number type and endpoints. The supplied candidate inputs are $-\sqrt{4}, \frac{1}{3}, \sqrt{2}, 3$. The declared domain is rational x with $-2 < x \leq 3$. The target output is 9.
Which candidates can represent the item-count input? The supplied candidate inputs are $-2, 0, 6$. The declared domain is whole-number item counts. The target output is \$30.	Filter the candidates through the closed interval. The supplied candidate inputs are $(-3, 4)$. The declared domain is $0 \leq x \leq 6$. The target output is 5.
Which candidate times fall within operating hours? The supplied candidate inputs are 8, 14, 19. The declared domain is hours 9 through 17 inclusive. The target output is target occupancy.	Apply all three domain conditions to the candidate set. The supplied candidate inputs are $-6, -2, 3, 8$. The declared domain is integers x with $-3 \leq x < 8$ and $x \neq 3$. The target output is 4.

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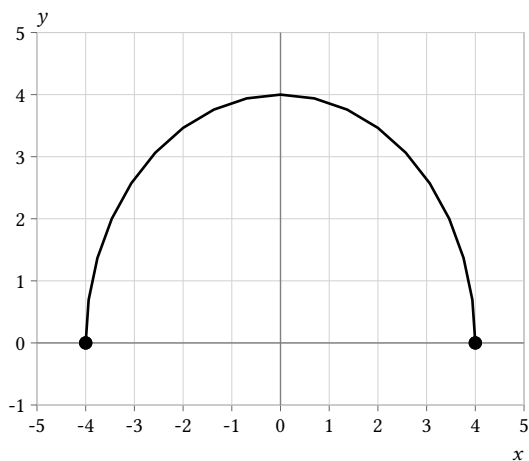
Finding Inputs from
Function Outputs

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Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: Every x in $[-1, 4]$.

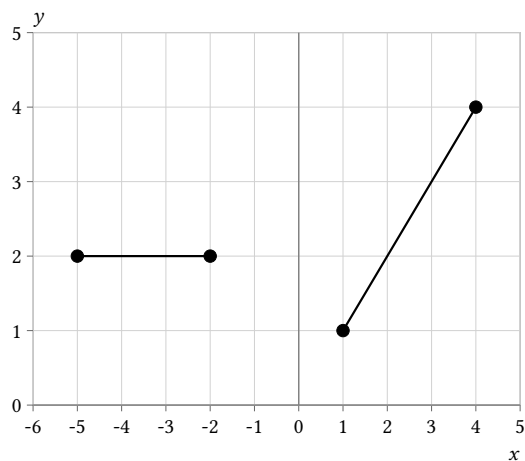
Recover the inputs at the semicircle's zero level.



Your response: _____

Incoming: $x = -4$ and $x = 4$.

Find all inputs at height 2 across both pieces.



Your response: _____

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Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

Does the output bound make the observed reverse lookup complete?

rows: (1, 7), (4, 2), (8, 7); table scope: partial; additional fact: all outputs are between 0 and 10; target output: 7

Input	Output
1	7
4	2
8	7

Diagnose the direction error and recover the input.

The rule is $f(x) = 2x + 1$. The target output is 9. The supplied student work is: $f(9) = 19$, so the answer is 19.

Finding Inputs from Function Outputs

Full Worked Solutions - excerpt

Worked example

Problem. Is the extra range fact sufficient for a complete reverse lookup?

rows: $(0, 8), (2, 3), (5, 8)$; table scope: partial; additional fact: every unlisted input has output below 0; target output: 8

Input	Output
0	8
2	3
5	8

Answer. Yes. The full set is $\{0, 5\}$.

Explanation and check.

Both listed matches count, and negative unlisted outputs cannot equal 8.

Worked example

Problem. Select all candidates allowed by the even-integer domain.

The supplied candidate inputs are -4, 1, 6. The declared domain is even integers. The target output is 12.

Answer. $\{-4, 6\}$.

Explanation and check.

Both -4 and 6 are even; 1 is not.