Sets & Steps
Math Practice & Worked Solutions

AP Precalculus

One-to-One Functions and Domain Restrictions

One-to-One Functions and Domain Restrictions | APPC-U02-P13

96 problems · Four activity formats

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Topic focus

Across 96 tasks this topic asks for displayed-table invertibility, finite versus continuous claim, limited conclusion, interval restriction containing both, whether interval restriction can contain both and whether full domain is one-to-one.

8 PDFs and a README; 110 buyer pages.

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

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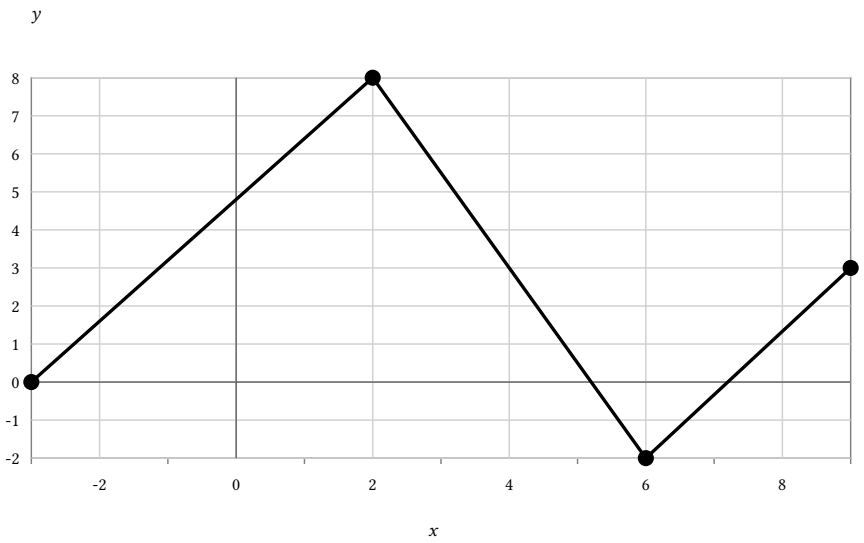
Name: _____ **Date:** _____ **Class:** _____

Answer each question and record the matching bank letter. Give exact values. A value without its unit is not a complete answer.

Choose the maximal one-to-one segment containing the marked input $x = 4$.



-3	0
2	8
6	-2
9	3

Bank label: _____

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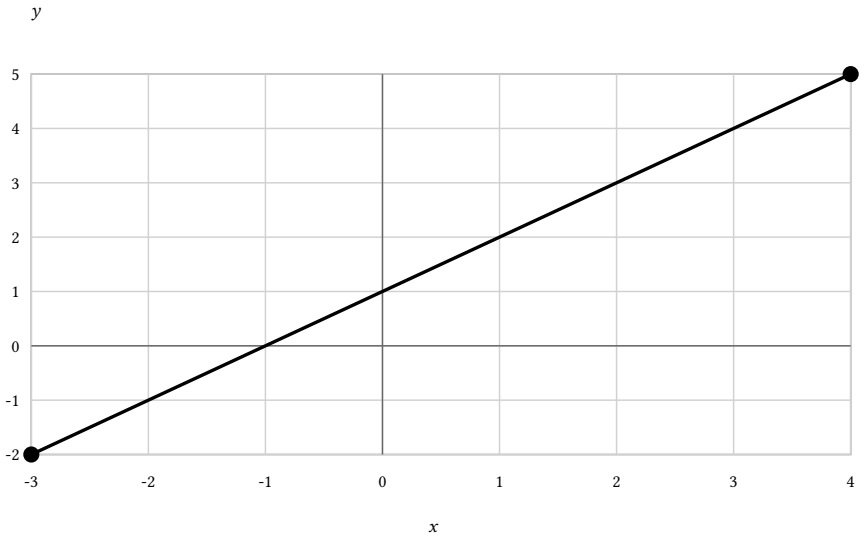
Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. A value without its unit is not a complete answer.

Decide whether the graphed function is one-to-one on its stated domain.



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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: $[-2, 3]$.

Select the time domain that makes height invertible for questions explicitly about the ascent.

Given: $0 \le t \le 8$ seconds

Height: $h(t) = 16 - (t - 4)^2$ meters; Question context: recover time during ascent

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.

Evaluate the cross-piece output ranges before accepting the claim. A student accepts the claim because each piece increases. Identify the invalid inference and give a cross-piece collision.

Given: $[-4, -2]$ union $[1, 3]$

Claim: Each piece is increasing, so the union is invertible.; Rule: $f(x) = x + 5$ on $[-4, -2]$; $f(x) = 2x$ on $[1, 3]$

Do the samples prove that the underlying model is invertible on all positive reals? Explain. A student says four distinct sampled outputs prove invertibility on all positive reals. Identify the unsupported extension.

Given domain/context: sampled inputs from an unspecified model

1	3
2	5
4	9
8	17

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Full Worked Solutions - excerpt

Worked example

Problem. For which k is q_k one-to-one on the entire interval $[-2, 4]$?

Given: $-2 \le x \le 4$

Family: $q_k\ (x) = (x - k)^2$

Answer. $k \le -2$ or $k \ge 4$.

Explanation and check.

The vertex must not lie in the interval's interior.

Worked example

Problem. Test the proposed restriction and either prove uniqueness or provide two allowed inputs with one output.

Given: $x \ge -1$

Claim: Restricting to $x \ge -1$ makes f invertible.; Rule: $f(x) = (x - 2)^2$

Answer. It is not sufficient: $f(1) = f(3) = 1$, and both inputs satisfy $x \ge -1$.

Explanation and check.

The restricted interval still crosses the vertex at $x = 2$.