

Precalculus
Inverse Functions & Domain Restrictions | 3-Topic Precalculus Bundle

3-topic bundle | 288 problems | Four activity formats

01 One-to-One Functions and Domain Restrictions

[View individual product and its full preview](#)

02 Finding Inverse Functions

[View individual product and its full preview](#)

03 Verifying Inverse Functions

[View individual product and its full preview](#)

In every topic

Answer Bank Challenge	24 tasks
Grid Rounds	24 tasks
Match & Move	24 cards
Error Analysis & Strategy	24 tasks
Quick Answer Key and Full Worked Solutions	included
Teacher / Parent Use Guide and Terms of Use	included

Product previews

The following preview pages show the cover, all four activity formats, and worked examples for each included resource, in the listed order.

24 PDFs and 3 READMEs; 303 buyer PDF pages across the 3 products.

Preview pages are not included in the buyer page count. Check the list against resources you already own.

This is a fixed collection of the listed products. Purchase includes the existing individual resource files. To open a product's online preview, follow its title link and select View Preview.

AP Precalculus
One-to-One Functions and Domain Restrictions

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

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
03	Match & Move	24 cards
04	Error Analysis & Strategy	24 tasks
05	Quick Answer Key	96 answers
06	Full Worked Solutions	96 solutions
07	Teacher / Parent Use Guide	included
08	Terms of Use & License	included

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.

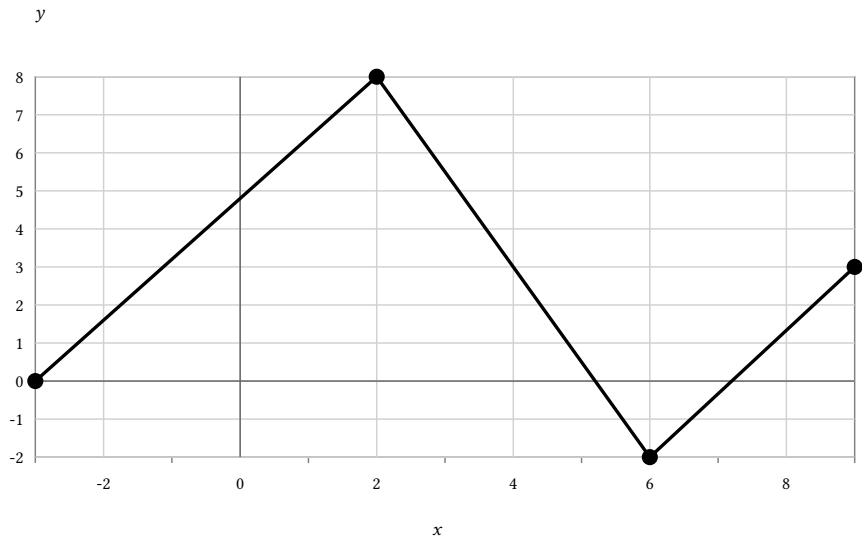
AP Precalculus

One-to-One Functions and Domain Restrictions

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: _____

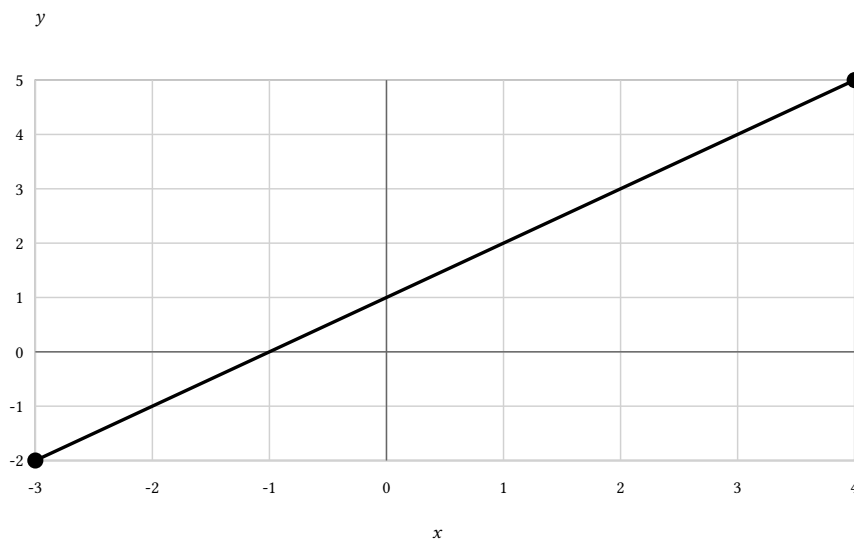
AP Precalculus

**One-to-One Functions and
Domain Restrictions**

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.

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



AP Precalculus

**One-to-One Functions and
Domain Restrictions**

Name: _____ Date: _____ Class: _____

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: $0 \leq t \leq 8$ secondsHeight: $h(t) = 16 - (t - 4)^2$ meters; Question context: recover time during ascent

Your response: _____

AP Precalculus

One-to-One Functions and Domain Restrictions

Name: _____ Date: _____ Class: _____

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

One-to-One Functions and Domain Restrictions

Full Worked Solutions - excerpt

Worked example

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

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

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

Answer. $k \leq -2$ or $k \geq 4$.

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: $x \geq -1$

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

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

Explanation and check.

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

AP Precalculus
Finding Inverse Functions

Finding Inverse Functions | APPC-U02-P14

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
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Topic focus

Across 96 tasks this topic asks for eighth-root inverse and domain, inverse and bounded domain, inverse and domain, inverse and finite domain, inverse branch rules and intervals and inverse branches with open images.

8 PDFs and a README; 80 buyer pages.

AP Precalculus

Finding Inverse Functions

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.

Reverse the finite mapping and evaluate the requested inverse value.
Required output: inverse table and $f^{-1}(8)$

Input	Output
-2	5
0	1
3	8

AP Precalculus

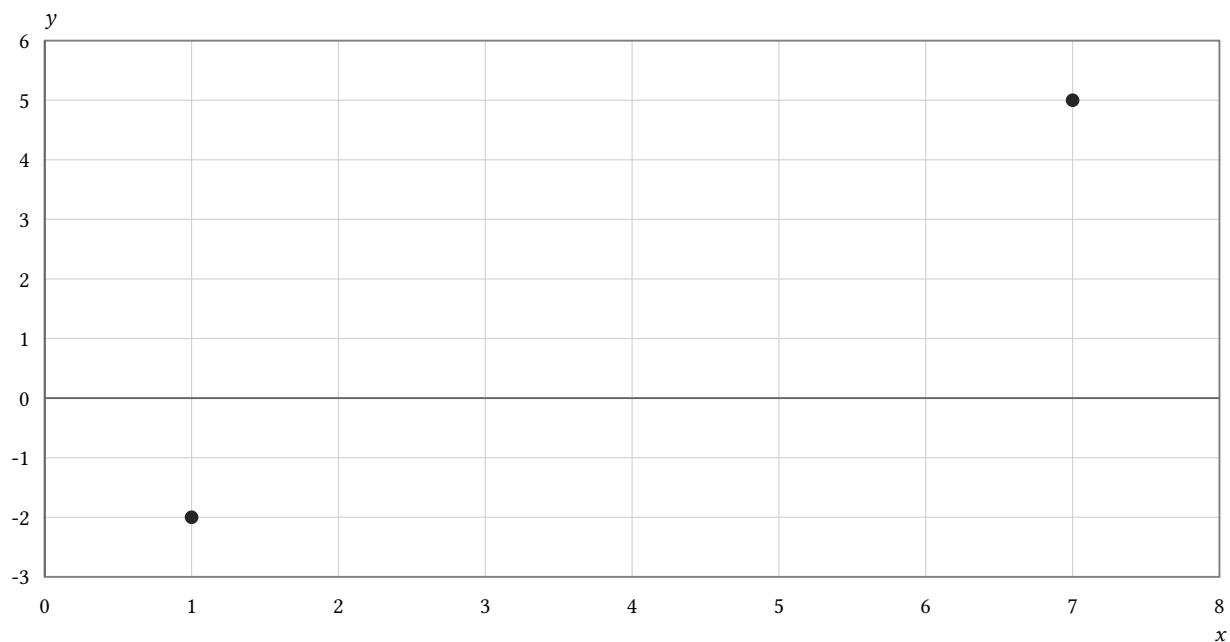
Finding Inverse Functions

Name: _____ Date: _____ Class: _____

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.

START

Identify the two endpoints of the reflected inverse curve.



Your response: _____

AP Precalculus

Finding Inverse Functions

Name: _____ Date: _____ Class: _____

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.

Construct the inverse of the decreasing odd-power chain. A student proposes $\sqrt[5]{x} - 2 - 7$. Locate the first incorrect inverse operation and repair the rule.

Domain: all real numbers

Given rule: $p(x) = 7 - (x + 2)^5$

Solve for the inverse and state its excluded input and output values. A student keeps $x \neq -\frac{5}{2}$ as the inverse input exclusion. Diagnose the interchange of domain and range.

Domain: x is not $-\frac{5}{2}$

Given rule: $f(x) = \frac{3x-2}{2x+5}$

Write the inverse pieces in increasing order of their new input intervals. A student reverses the formulas but keeps the original input intervals on the inverse pieces. Identify and repair the interval error.

Domain: $[-3, 0]$ union $[2, 6)$

Given rule: $f(x) = 4 - x$ for $-3 \leq x \leq 0$; $f(x) = 3x + 8$ for $2 \leq x < 6$

Construct the inverse of the decreasing radical branch and retain its exact range. A student gives $9 - x^2$ as the inverse on every real input. Explain why the algebraic expression alone is insufficient.

Domain: $0 \leq x \leq 9$

Given rule: $r(x) = \sqrt{9 - x}$

Finding Inverse Functions

Full Worked Solutions - excerpt

Worked example

Problem. Reverse the root and translations in their operational order.

Domain: all real numbers

Given rule: $h(x) = \sqrt[3]{x-4} + 2$

Answer. $h^{-1}(x) = (x-2)^3 + 4$.

Explanation and check.

Subtract 2, cube, and then add 4.

Worked example

Problem. Recover both inverse intercepts and one additional reflected point.

Domain: an invertible interval

Given facts: [" $f(0) = 9$ ", " $f(-4) = 0$ ", " $f(2) = 13$ "]

Answer. The inverse x -intercept is 9, its y -intercept is -4 , and it contains $(13, 2)$.

Explanation and check.

Reflect $(0, 9)$, $(-4, 0)$, and $(2, 13)$.

AP Precalculus
Verifying Inverse Functions

Verifying Inverse Functions | APPC-U02-P15

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
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Topic focus

Across 96 tasks this topic asks for complete membership audit, complete reflection verdict, component-level verdict, distinct identities, endpoint-sensitive verdict and equality-set and identities.

8 PDFs and a README; 113 buyer pages.

AP Precalculus

Verifying Inverse Functions

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. Give the whole requested response, including any reasoning the question asks for.

Audit all reversed pairs and identify any failure. Required output: complete verdict and the supporting evidence requested above <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 20px;"> <tr> <th style="width: 25%;">Input</th><th style="width: 25%;">f(input)</th><th style="width: 25%;">Input</th><th style="width: 25%;">g(input)</th></tr> <tr> <td>-4</td><td>7</td><td>7</td><td>-4</td></tr> <tr> <td>0</td><td>2</td><td>2</td><td>0</td></tr> <tr> <td>5</td><td>-1</td><td>-1</td><td>5</td></tr> <tr> <td>8</td><td>9</td><td>9</td><td>6</td></tr> </table>	Input	f(input)	Input	g(input)	-4	7	7	-4	0	2	2	0	5	-1	-1	5	8	9	9	6	Identify why the successful composition is insufficient on the declared domain of f. Domain: f on all real numbers; g on $x \geq 0$ Given claim: $f(g(x)) = x$ proves they are inverses Given $f: f(x) = x^2$ Given $g: g(x) = \sqrt{x}$
Input	f(input)	Input	g(input)																		
-4	7	7	-4																		
0	2	2	0																		
5	-1	-1	5																		
8	9	9	6																		
The formulas reverse algebraically. Decide whether the declared domains make them inverse functions. Domain: $f: x$ is not 2; proposed g: all real x Given $f: f(x) = \frac{1}{x-2} + 5$ Given $g: g(x) = 2 + \frac{1}{x-5}$	Explain why the successful direction does not certify the larger-domain function. Domain: f on all real numbers; g on $x \geq 0$ Given claim: $f(g(x)) = x$ for $x \geq 0$ proves inverses Given $f: f(x) = x$ Given $g: g(x) = x$																				

AP Precalculus

Verifying Inverse Functions

Name: _____ Date: _____ Class: _____

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.

START

Determine whether the proposed inverse output set matches the original input set.

Domain: $f: -4 \leq x \leq 3$; proposed g range: $-4 \leq y \leq 4$

Given facts: [" f is one-to-one", " g domain equals $\text{range}(f)$ ", "candidate formula is correct"]

Your response: _____

Incoming: No. $\text{range}(g)$ must end at 3, not 4; the candidate declares an output that is not in $\text{domain}(f)$.

Check whether the extra row preserves a valid inverse function.

Required output: complete verdict and the supporting evidence requested above

Input	$f(\text{input})$
-6	2
0	8
5	-1
9	12

Input	$g(\text{input})$
2	-6
8	0
-1	5
12	9
8	4

Your response: _____

Incoming: No. g must have a hole at $(5, 1)$; filling it adds an inverse input absent from $\text{range}(f)$.

Explain why the declared domain of f prevents certification.

Domain: f on all real numbers; g on $x \geq 1$

Given evidence: $f(g(x)) = x$

Given f : $f(x) = (x - 4)^2 + 1$

Given g : $g(x) = 4 + \sqrt{x - 1}$

Your response: _____

Incoming: For $x < 4$, $g(f(x)) = 4 + |x - 4| = 8 - x$ rather than x , so f must be restricted to $x \geq 4$.

Use the nonpositive sign of $x - 1$ when checking the reverse composition.

Domain: $f: x \leq 1$; $g: x \geq 2$

Given f : $f(x) = 2 + (x - 1)^2$

Given g : $g(x) = 1 - \sqrt{x - 2}$

Your response: _____

AP Precalculus

Verifying Inverse Functions

Name: _____ Date: _____ Class: _____

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.

Name the additional identity and set information required.

Domain: unspecified function domains

Given claim: This alone proves f and g are inverses

Given evidence: $f(g(x)) = x$ wherever g is defined

Test the claim using composition rather than product notation.

Domain: nonzero real x

Given claim: $f^{-1}(x) = \frac{1}{2x}$

Given function: $f(x) = 2x$

Compute both round trips and certify or reject the inverse claim. Student work/claim: Checking only $f(g(x))$ for $f(x) = 3x + 2$ and $g(x) = \frac{x-2}{3}$ is enough to certify the inverse claim. Identify the first invalid inference or omitted check, correct it, and complete the original task.

Verifying Inverse Functions

Full Worked Solutions - excerpt

Worked example

Problem. Explain why the evidence does not establish an inverse pair. Choose between testing one successful input and verifying both composition identities on the full declared domains. Use the sufficient method.

Answer. One successful input can neither prove $f(g(x)) = x$ for all allowed x nor verify $g(f(x)) = x$ on the other domain.

Explanation and check.

Inverse verification requires identities on the full relevant sets, not one sample.

Worked example

Problem. Explain why an algebraic identity alone may fail to define a valid composition everywhere claimed.

Answer. Outputs of g must lie in $\text{domain}(f)$, and $\text{domain}(g)$ must equal $\text{range}(f)$; otherwise the symbolic substitution can simplify where the actual composition is undefined.

Explanation and check.

Function composition is governed by declared sets as well as formulas.