Sets & Steps
Math Practice & Worked Solutions

AP Precalculus

Exponential and Logarithmic Inverse Models

Exponential and Logarithmic Inverse Models | APPC-U02-P18

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for adjusted inverse change, baseline-adjusted inverse change, baseline-adjusted inverse rule, inverse change, inverse multiplicative-additive rule and inverse rule.

8 PDFs and a README; 73 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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AP Precalculus

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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.

Recover cycle number from remaining carbon and retain the discrete operating condition.

Your complete response must include inverse and physical inputs.

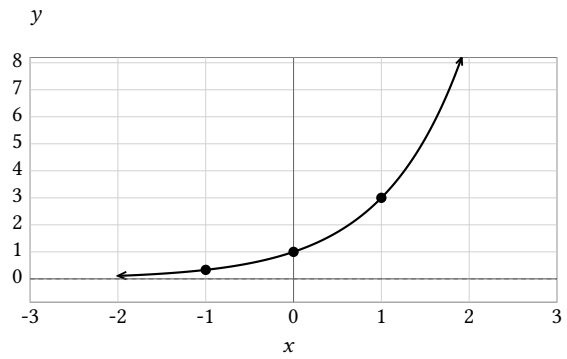
Use the condition whole-number cycles 0 through 10.

Use the model $Q(n) = 100(0.75)^n$.

Use cycles and grams as the stated units.

Bank label: _____

Reflect the marked graph across $y = x$.



-1	$\frac{1}{3}$
0	1
1	3

Bank label: _____

Undo the logarithm and both shifts.

Your complete response must include inverse.

Use the condition $x > -2$.

Consider the statement $g(x) = \log_5(x + 2) - 4$.

Bank label: _____

Recover treatment number from concentration and retain physical attainability.

Your complete response must include inverse and discrete condition.

Use the condition whole-number treatments 0 through 8.

Use the model $C(n) = 60(0.7)^n$.

Use treatments and milligrams per liter as the stated units.

Bank label: _____

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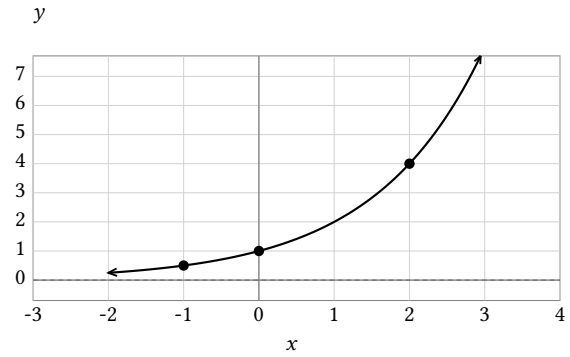
Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. A value without its unit is not a complete answer.

Swap the coordinates to construct the inverse logarithm table and name its rule.

Given domain/context: exact table from $y = 2^x$

-1	0.5
0	1
1	2

Reflect the marked graph features across $y = x$.



-1	0.5
0	1
2	4

Undo the output shift and scale before taking a logarithm.

Your complete response must include inverse formula and domain.

Use the condition all real inputs.

Consider the statement $f(x) = 2 \cdot 3^x + 1$.

Construct the exponential inverse and state its range.

Your complete response must include inverse formula and exchanged sets.

Use the condition $x > 1$.

Consider the statement $g(x) = \log_2(x - 1) + 3$.

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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: Inverse points $(6, 0), (3, 1)$, and $(\frac{9}{4}, 2)$, with vertical asymptote $x = 2$ and domain $x > 2$.

Recover the scale coordinate from intensity and transfer both operating endpoints.

Your complete response must include inverse and attainable interval.

Use the condition $-2 \le s \le 3$ scale units.

Use the model $I(s) = 5 \cdot 10^{s}$.

Use scale units and watts as the stated units.

Your response: _____

Incoming: $s(I) = \log_{10}(\frac{I}{5})$, for $0.05 \le I \le 5000$ watts.

Translate the forward multiplier into the inverse relation.

Your complete response must include inverse change.

Use the condition exact base-4 process.

The forward rule states that input +1 multiplies output by 4.

Your response: _____

Incoming: $t(A) = 2\log_{4}(\frac{A}{20})$, for $20 \le A \le 1280$ square centimeters.

Recover hours from mold area during the finite observation window.

Your complete response must include inverse and domain.

Use the condition $0 \le h \le 15$ hours.

Use the model $A(h) = 4 \cdot 2^{\frac{h}{3}}$.

Use hours and square centimeters as the stated units.

Your response: _____

Incoming: $f^{-1}(x) = -2 + \log_{3}(\frac{8-x}{7})$, defined for $x < 8$.

Normalize above the baseline before taking a logarithm.

Your complete response must include inverse and domain.

Use the condition all real inputs.

Consider the statement $f(x) = 2 \cdot 6^{x} + 4$.

Your response: _____

Incoming: $t(M) = 2\log_{3}(\frac{M}{25})$, for $25 \le M \le 2025$ microbes.

Recover elapsed time from the covered area.

Your complete response must include inverse and attainable domain.

Use the condition $0 \le t \le 6$ hours.

Use the model $A(t) = 20 \cdot 4^{\frac{t}{2}}$.

Use hours and square centimeters as the stated units.

Your response: _____

Incoming: $g^{-1}(x) = 5 + 2^{4-x}$, with range $x > 5$.

Recover time from a count over the stated experiment.

Your complete response must include inverse and interval.

Use the condition $0 \le t \le 8$ hours.

Use the model $M(t) = 25 \cdot 3^{\frac{t}{2}}$.

Use hours and microbes as the stated units.

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.

Test the proposed inverse and repair the shift. Identify the wrong shift in the proposed inverse and repair it. Verify your correction by composition.

Your complete response must include correction.

Use the condition real exponential inputs.

Let $f(x) = 2^{x+3}$.

The proposed inverse is $\log_2(x) + 3$.

Assess the formulas and the claimed inverse domain separately. Diagnose the claimed inverse domain separately from the two formulas.

Your complete response must include domain repair.

Use the condition real exponential inputs.

Evaluate the claim g has domain $x > 0$.

Let $f(x) = 2^x + 1$.

Let $g(x) = \log_2(x - 1)$.

Exponential and Logarithmic Inverse Models

Full Worked Solutions - excerpt

Worked example

Problem. Translate the forward multiplier into the inverse relation.

Your complete response must include inverse change.

Use the condition exact base-4 process.

The forward rule states that input $+1$ multiplies output by 4.

Answer. Multiplying an inverse input by 4 increases its recovered output by 1.

Explanation and check.

The former output ratio becomes the inverse input ratio.

Worked example

Problem. Normalize above the baseline before taking a logarithm.

Your complete response must include inverse and domain.

Use the condition all real inputs.

Consider the statement $f(x) = 2 \cdot 6^{x} + 4$.

Answer. $f^{-1}(x) = \log_{6}(\frac{x-4}{2})$, for $x > 4$.

Explanation and check.

Subtract 4 and divide by 2 to expose the positive power.