Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Exponential Functions from Tables

Exponential Functions from Tables | A1-U07-P13

96 problems · Four activity formats

Topic focus

This topic is a focused set of 96 practice tasks on Exponential Functions from Tables.

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.

Published by Tusils LLC.

Algebra 1

Exponential Functions from Tables

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

Answer each question and record the matching bank letter. Give exact values. Give the whole requested response, including any reasoning the question asks for.

Construct $n(x) = ab^x$ from the exact unit-spaced rows $n(2) = 12, n(3) = 24, n(4) = 48$. Use the complete requested exponential rule as the matching response, retaining the positive-base family and original verification of every table row.

Assumption: $n(x) = ab^x$

x	n(x)
2	12
3	24
4	48

Bank label: _____

A table begins with $r(1) = -8$ and continues $r(2) = -4, r(3) = -2$. Under the exponential assumption, determine $r(x)$. Use the complete requested exponential rule as the matching response, retaining the positive-base family and original verification of every table row.

Assumption: $r(x) = ab^x$

x	r(x)
1	-8
2	-4
3	-2

Bank label: _____

The table begins at $x = 2$ and has values $\frac{45}{4}, \frac{135}{8}, \frac{405}{16}$ at consecutive inputs. Find the exact formula $M(x) = ab^x$. Use the complete requested exponential rule as the matching response, retaining the positive-base family and original verification of every table row.

Assumption: $M(x) = ab^x$

x	M(x)
2	$\frac{45}{4}$
3	$\frac{135}{8}$
4	$\frac{405}{16}$

Bank label: _____

The unit-spaced outputs for V are $\frac{21}{4}, \frac{147}{16}, \frac{1029}{64}$ at $x = 1, 2, 3$. Recover the underlying ab^x rule. Use the complete requested exponential rule as the matching response, retaining the positive-base family and original verification of every table row.

Assumption: $V(x) = ab^x$

x	V(x)
1	$\frac{21}{4}$
2	$\frac{147}{16}$
3	$\frac{1029}{64}$

Bank label: _____

Algebra 1

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

A positive-base exponential function has $v(1) = 9, v(2) = 3$, and $v(3) = 1$. Determine the unlisted value $v(0)$ and then the rule.

Assumption: $v(x) = ab^x$

x	v(x)
1	9
2	3
3	1

$F(t)$ is exact and t counts years after 2024. If $F(0) = 50, F(1) = 75$, and $F(2) = \frac{225}{2}$, find the exponential rule and identify its time origin.

Input unit: years after 2024

t	F(t)
0	50
1	75
2	$\frac{225}{2}$

Fit $N(x) = ab^x$ to $N(-2) = -72, N(-1) = -24, N(0) = -8$. Why is the base not negative?

Assumption: $N(x) = ab^x$

x	N(x)
-2	-72
-1	-24
0	-8

An exact positive-base exponential table has $f(0) = 3$ and $f(2) = 12$. Fill the missing interior output $f(1)$.

Assumption: $f(x) = ab^x, b > 0$

x	f(x)
0	3
1	_____
2	12

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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: $f(x) = 3(2)^x$.

Fit $g(x) = ab^x$ to the exact rows $(0, 40)$, $(1, 20)$, and $(2, 10)$, using $b > 0$ and $b \neq 1$. Use the complete requested exponential rule as the matching response, retaining the positive-base family and original verification of every table row.

Assumption: $g(x) = ab^x$

x	g(x)
0	40
1	20
2	10

Your response: _____

Incoming: $H(x) = (\frac{5}{2})(\frac{1}{5})^x$.

Assuming the table is exact and exponential, find $J(x)$ from the consecutive rows $(1, 6)$, $(2, 18)$, and $(3, 54)$. Use the complete requested exponential rule as the matching response, retaining the positive-base family and original verification of every table row.

Assumption: $J(x) = ab^x$

x	J(x)
1	6
2	18
3	54

Your response: _____

Incoming: $k(x) = -16(\frac{1}{2})^x$.

The first displayed input is 1, not 0. Find the exponential rule through $(1, 10)$, $(2, 50)$, and $(3, 250)$. Use the complete requested exponential rule as the matching response, retaining the positive-base family and original verification of every table row.

Assumption: $m(x) = ab^x$

x	m(x)
1	10
2	50
3	250

Your response: _____

Incoming: $D(x) = 2(7)^x$.

Write $E(x) = ab^x$ for the table $E(0) = -\frac{3}{2}$, $E(1) = -3$, $E(2) = -6$. Use the complete requested exponential rule as the matching response, retaining the positive-base family and original verification of every table row.

Assumption: $E(x) = ab^x$

x	E(x)
0	$-\frac{3}{2}$
1	-3
2	-6

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.

A table contains only $f(0) = 7$. Under the nonconstant exponential family $f(x) = ab^x$, does this row identify one rule? Explain what is and is not fixed. Compare the claim that at least one allowed exponential rule fits the listed data with the claim that the data identify exactly one such rule. Decide each claim from the original givens and explain the difference between incompatible data and compatible but insufficient data.

Claim: $f(x) = ab^x$ with $a \neq 0, b > 0, b \neq 1$

x	f(x)
0	7

Does the lone exact observation $g(2) = 12$ identify a unique positive-base exponential rule $g(x) = ab^x$? Give the parameter relationship. Compare the claim that at least one allowed exponential rule fits the listed data with the claim that the data identify exactly one such rule. Decide each claim from the original givens and explain the difference between incompatible data and compatible but insufficient data.

Claim: $g(x) = ab^x$

x	g(x)
2	12

Exponential Functions from Tables

Full Worked Solutions - excerpt

Worked example

Problem. Choose three inputs from $\{0, 1, 2, 3\}$ and construct an exact table that identifies $f(x) = 3(2)^x$, with one row left as an independent check after a and b are found.

Answer. One valid table is $(0, 3), (1, 6), (2, 12)$. The first two rows give $a = 3$ and $b = 2$; the third checks the rule.

Explanation and check.

Inputs 0 and 1 directly expose the coefficient and unit ratio. Evaluating the stated model at $x = 2$ supplies 12 as a separate verification row.

Worked example

Problem. Using only inputs $\{1, 2, 3, 4\}$, build a three-row exact table that identifies $g(x) = 40(\frac{1}{2})^x$ and includes a nonadjacent check.

Answer. For example: $(1, 20), (2, 10), (4, \frac{5}{2})$. The first pair gives $b = \frac{1}{2}$ and then $a = 40$; the last row checks a two-unit factor.

Explanation and check.

The allowed adjacent inputs 1 and 2 identify the unit multiplier. From $g(1) = 20$, dividing by $\frac{1}{2}$ recovers a, and $g(4) = \frac{40}{16} = \frac{5}{2}$ verifies the fit.