

keep scrolling to get
a sneak peek!

Help your Algebra 2 and Pre-Calculus students practice **converting between logarithm and exponential forms**. Students will be eager to get the self-checking benefits from this circuit activity!

CONVERT LOGARITHM & EXPONENTIAL FORMS

Differentiated Circuit Worksheet

Date: _____

Answer Key

CONVERTING BETWEEN LOGARITHMIC & EXPONENTIAL FORMS

A circuit is a route that starts and ends at the same place. Start in the first box, solve the problem. Search through the remaining boxes for the answer you got for the previous question. Continue until you have completed the questions and you return to the original question. Record your path below.

8 → 3 → 10 → 6 → 2 → 9 → 4 → 7 → 5

Answer: $5^{-2} = 1/25$ # <u>5</u>	Previous Answer: $\ln(n) = m$
1. Rewrite in logarithmic form. $b^x = y$ $\log_b y = x$	2. Rewrite in exponential form. $4 = \log_3 81$ $\log_3 81 = 4$ $3^4 = 81$
Answer: $c^{-1} = \frac{1}{d}$ # _____	Previous Answer: $k = \ln(t)$
1. Rewrite in logarithmic form. $a^m = n$	2. Rewrite in exponential form. $\log_b x = y$
Answer: $m^p = n$ # _____	Previous Answer: $\log_w z = -r$
3. Rewrite in exponential form. $\ln y = 4$	4. Rewrite in logarithmic form.



2 versions + Answer key included

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Why do you need this?



It's self-checking! Your students will know if they are correct or not.



2 differentiated versions for all students practice this essential math skill.

Convert Logarithm & Exponential Forms Circuit

Name: _____ Date: _____

CONVERTING BETWEEN LOGARITHMIC & EXPONENTIAL CIRCUIT

Directions: A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → _____ → _____ → _____ → _____ → _____

Previous Answer: $c^{-1} = \frac{1}{d}$ 1. Rewrite in logarithmic form. $a^m = n$	# _____	Previous Answer: $\log_b y = x$
Previous Answer: $m^p = n$ 3. Rewrite in exponential form. $\ln y = 4$	# _____	Previous Answer: $\log y = x$ 7. Rewrite in exponential form. $\log_{10} 2$
Previous Answer: $10^x = x$ 5. Rewrite in exponential form. $\log_c \left(\frac{1}{d}\right) = -1$	# _____	Previous Answer: $3^3 = 81$ 9. Rewrite in logarithmic form. $m^2 = n$
		Previous Answer: $\log_b y = x$ 8. Rewrite in exponential form. $\log_2 64 = 6$
		Previous Answer: $e^x = a$ 10. Rewrite in exponential form. $2 = \log_4 16$

Helpful Hints: Use these hints to help you solve the problems.

$\log_b a = c \leftrightarrow b^c = a$
 $\log_{10} a = c \leftrightarrow \log a$
 $\log e a$

Log & Exponential Forms Circuit *includes:*

- ✓ 10 self-checking problems
- ✓ a detailed answer key
- ✓ a standard version with an extension question
- ✓ a basic version with helpful hints section
- ✓ student self assessment

Challenge: Prove algebraically that $\log_b 1 = 0$ for any valid base b .

How are you feeling about this topic? Circle one:

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Helpful Hints: Use these hints to help you solve the problems.

$$\log_b a = c \leftrightarrow b^c = a$$
$$\log_{10} a = c \leftrightarrow \log a = c$$
$$\ln a = b \leftrightarrow \log_e a = b$$

How are you feeling about this topic? Circle one:

Log & Exponential Forms Circuit

standards covered:

CCSS: HSA-SSE.B.3, HSF-LE.A.4

TEKs: A2.5.C

CONVERTING BETWEEN LOGARITHMIC & EXPONENTIAL CIRCUIT

Previous Answer: $\log_a q = p$ # 4 7. Rewrite in exponential form. $\log x = r$ $10^r = x$	Previous Answer: $\log_a n = m$ # 1 8. Rewrite in exponential form. $\log_m n = p$ $m^p = n$
Previous Answer: $b^{-3} = x$ # 2 9. Rewrite into logarithmic form. $w^r = z$ $\log_w z = -r$	Previous Answer: $e^u = y$ # 3 10. Rewrite in exponential form. $\log_7 49 = 2$ $7^2 = 49$

Challenge: Prove algebraically that $\log_b 1 = 0$ for any valid base b .

Let $\log_b 1 = x$
then

how this circuit resource works

Then search for their answer on the worksheet. Once the answer is found, students complete the problem below it.

Students can track their path at the top.

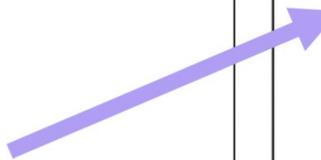
Name: _____ Date: _____

CONVERTING BETWEEN LOGARITHMIC & EXPONENTIAL CIRCUIT

Directions: A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → ___ → ___ → ___ → ___ → ___ → ___ → ___ → ___ → 1

Previous Answer: $5^{-2} = 1/25$ # _____	Previous Answer: $\ln(n) = m$ # _____
1. Rewrite in logarithmic form. $b^x = y$	2. Rewrite in exponential form. $4 = \log_3 81$
Previous Answer: $2^6 = 64$ # _____	Previous Answer: $\log_m n = -2$ # _____
3. Rewrite in exponential form. $\ln(a) = x$	4. Rewrite in logarithmic form. $10^x = y$



Students start with the first question.

The last question they answer should lead back to problem #1 to "close" the circuit.

how to use this resource

Name: **Answer Key** Date: _____

CONVERTING BETWEEN LOGARITHMIC & EXPONENTIAL CIRCUIT

Directions: A circuit is a route that starts and ends at the same place. Start in the first box labeled 1 and solve the problem. Search through the remaining boxes for the answer you got for question 1. Now complete that question. Continue until you have completed the questions and you are back to the original question. Record your path below.

1 → **8** → **3** → **10** → **6** → **2** → **9** → **4** → **7** → **5** → 1

Previous Answer: $c^{-1} = \frac{1}{a}$ # 5	Previous Answer: $k = \ln(t)$ # 6
1. Rewrite in logarithmic form. $a^m = n$	2. Rewrite in exponential form.

<h2>CONVERTING BETWEEN LOGARITHMIC & EXPONENTIAL CIRCUIT</h2>	
Previous Answer: $\log y = x$ # 4	Previous Answer: $\log_b y = x$ # 1
7. Rewrite in exponential form. $\log_{10} 100 = 2$ $10^2 = 100$	8. Rewrite in exponential form. $\log_2 64 = 6$ $2^6 = 64$
Previous Answer: $m^p = n$	Previous Answer: $e^x = a$ # 3
3. Rewrite in exponential form. $\ln y = 4$ $\log_e y = 4$ $e^4 = y$	10. Rewrite in exponential form. $2 = \log_4 16$ $\log_4 16 = 2$ $4^2 = 16$
Previous Answer: $10^r = x$	9. Rewrite in logarithmic form. $m^2 = n$ $\log_m n = -2$
5. Rewrite in exponential form. $\log_c \left(\frac{1}{a}\right) = -1$ $c^{-1} = \frac{1}{a}$	

This is a great activity to use when reviewing how to convert logarithmic and exponential forms.

It can be used right after teaching the concept or as homework.

This is also a **substitute-friendly** assignment!

You may also enjoy...

BASICS OF LOGARITHMIC FUNCTIONS

Algebra 2 Guided Notes

Basics of Logarithmic Functions

Logarithm definition: $\log_b a = c \rightarrow b^c = a$
 $a > 0, b > 0, b \neq 1$

"Log base b of a equals c"

Exponential Form: $3^2 = \underline{\hspace{2cm}}$

Special Logarithms

Common Log has a base of $\underline{\hspace{2cm}}$

The Natural Log has a base of $\underline{\hspace{2cm}}$

Evaluating Logs with a Calculator - Round to the nearest hundredth

$\log 6$	$\log y 13$
0.7782	1.8502
$\ln 25$	$\log 0.25$
32.2189	-0.6021

Evaluating Logs Algebraically - without a calculator

$\log_2 64$	$\log_3 81$
$\log_2 2^6$	$\log_3 3^4$

Answer key included

with Ms. Rivera

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CONVERTING LOGARITHMIC & EXPONENTIAL FORMS

Printable Maze

Self-Checking

Converting Logarithms to Exponential Form Maze

Directions: Write each equation in exponential form. The answer will lead you to the next question. Don't forget to show your work!

Converting Exponents to Logarithmic Form Maze

Directions: Write each equation in logarithmic form. The answer will lead you to the next question. Don't forget to show your work!

START HERE!

Answer key included

with Ms. Rivera

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EXPONENTIAL & LOGARITHMIC FUNCTIONS

Algebra 2 Guided Notes

TRANSFORMATIONS OF LOGARITHMIC FUNCTIONS

Steps for Graphing Transformations of Logarithmic Functions

GRAPHING EXPONENTIAL FUNCTIONS

Steps for Graphing Exponential Functions

EXPONENTIAL FUNCTIONS WITH BASE E

The Natural Base e

Natural base exponential function: $f(x) = e^x$

Exponential decay function: $f(x) = e^{-x}$

Answer key included

with Ms. Rivera

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hey there!

My name is Malia and I'm passionate about making learning and practicing math fun. I love creating engaging math resources for my students and I hope your students enjoy this activity too!

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