

keep scrolling to get
a sneak peek!

Help your Algebra 2 and Pre-Calculus students practice **evaluating logarithms** using properties of logs. Students will be eager to get the self-checking benefits from this circuit activity!

EVALUATING LOGARITHMS

Differentiated Circuit Worksheet

Date: _____

EVALUATING LOGS WITHOUT A CALCULATOR 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.

4 → 8 → 2 → 7 → 3 → 9 → 5 → 6 → 1

0	# 6	Previous Answer: 1
1. Simplify the logarithm without a calculator.	$\log_2 32$ $\log_2(2^5)$ 5	2. Simplify the logarithm without a calculator. $\log_3(1/9)$ $\log_3(3^{-2})$ -2
er: 1	# 7	Previous Answer: 4
log	ulator.	4. Simplify the logarithm without a calculator. $\log_4 16$

EVALUATING LOGS WITHOUT A CALCULATOR

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: -1	# _____	Previous Answer: -1/2
1. Simplify the logarithm without a calculator. $\log_{1/3}(1/27)$		2. Simplify the logarithm without a calculator. $\log_{1/2} 1$
Previous Answer: 1/3	# _____	Previous Answer: -3
3. Simplify the logarithm without a calculator. $\log_4 81$		4. Simplify the logarithm without a calculator.



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.

Evaluating Logarithms Circuit

Name: _____ Date: _____

EVALUATING LOGS WITHOUT A CALCULATOR 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: -1	# _____	Previous Answer: 2
1. Simplify the logarithm without a calculator. $\log_{1/3}(1/27)$	2. Simplify the logarithm without a calculator. $\log_7 3$	7. Simplify the logarithm without a calculator. $\log_3 6$
Previous Answer: 1/3 <th># _____</th> <th>Previous Answer: 5</th>	# _____	Previous Answer: 5
3. Simplify the logarithm without a calculator. $\log_8 81$	4. Simplify the logarithm without a calculator. $\log_8 2$	10. Simplify the logarithm without a calculator. $\log_3 81$
Previous Answer: 1/4 <th># _____</th> <th>Previous Answer: 6</th>	# _____	Previous Answer: 6
5. Simplify the logarithm without a calculator. $\log_{10} 1$	6. Simplify the logarithm without a calculator. $\log_2(2^2)$	

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

Try this:
Can the argument, or value, be rewritten as an exponent where the base is the same as the base of the logarithm?

Evaluating Logarithms Circuit includes:

Challenge: Prove algebraically that $\log_{\frac{1}{b}} b = -1$ for $b > 0, b \neq 1$

How are you feeling about this topic? Circle one:

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

Try this:
Can the argument, or value, be rewritten as an exponent where the base is the same as the base of the logarithm?

Ex: We can rewrite $\log_2 4$ as $\log_2(2^2)$.

Basic Log Rules:
 $\log_a 1 = 0$
 $\log_a a = 1$
 $\log_a a^x = x$

How are you feeling about this topic? Circle one:

- ✓ 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

Evaluating Logarithms Circuit

standards covered:

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

TEKs: A2.5.C

EVALUATING LOGS WITHOUT A CALCULATOR CIRCUIT

Previous Answer: -2 # <u>2</u> 7. Simplify the logarithm without a calculator. $\log_{27} 3$ $\log_{27} (27^{1/3})$ $\boxed{1/3}$	Previous Answer: 1/2 # <u>4</u> 8. Simplify the logarithm without a calculator. $\log_4 (1/2)$ $\log_4 ((\frac{1}{2})^{-1})$ $\log_4 (4^{-1/2})$ $\boxed{-1/2}$
Previous Answer: 2 # <u>3</u> 9. Simplify the logarithm without a calculator. $\log_{16} 2$ $\log_{16} (16^{1/4})$ $\boxed{1/4}$	Previous Answer: 3 # <u>1</u> 10. Simplify the logarithm without a calculator. $\log_2 (1/8)$ $\log_2 (\frac{1}{2^3})$ $\log_2 2^{-3}$ $\boxed{-3}$

Challenge: Prove algebraically that $\log_{\frac{1}{b}} b = -1$ for $b > 0, b \neq 1$

$\log_{1/b} b = -1$
Let $\log_{1/b} b = x$

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.



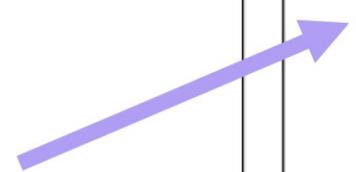
Name: _____ Date: _____

EVALUATING LOGS WITHOUT A CALCULATOR 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: -1 # _____	Previous Answer: -1/2 # _____
1. Simplify the logarithm without a calculator. $\log_{1/3}(1/27)$	2. Simplify the logarithm without a calculator. $\log_{1/2}4$
Previous Answer: 1/3 # _____	Previous Answer: -3 # _____
3. Simplify the logarithm without a calculator. \log_481	4. Simplify the logarithm without a calculator. $\log_{25}5$



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: _____

EVALUATING LOGS WITHOUT A CALCULATOR 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 → **10** → **4** → **8** → **2** → **7** → **3** → **9** → **5** → **6** → 1

Previous Answer: -1 # 6	Previous Answer: -1/2 # 8
1. Simplify the logarithm without a calculator.	2. Simplify the logarithm without a calculator.

$\log_{1/3}(1/27)$ $10_{1/3}(\frac{1}{3})^3$ 3	<h2>EVALUATING LOGS WITHOUT A CALCULATOR CIRCUIT</h2> <table border="1"> <tr> <td>Previous Answer: -2 # 2</td> <td>Previous Answer: 2 # 4</td> </tr> <tr> <td>7. Simplify the logarithm without a calculator.</td> <td>8. Simplify the logarithm without a calculator.</td> </tr> <tr> <td> $\log_9 3$ $10_9(9^{1/2})$ 1/2 </td> <td> $\log_6 6$ $10_6 6^1$ 1 </td> </tr> <tr> <td>Previous Answer: 3 # 3</td> <td>Previous Answer: 5 # 1</td> </tr> <tr> <td>9. Simplify the logarithm without a calculator.</td> <td>10. Simplify the logarithm without a calculator.</td> </tr> <tr> <td> $\log_8 2$ $10_8(8^{1/3})$ 1/3 </td> <td> $\log_3 81$ $10_3(3^4)$ 4 </td> </tr> </table>	Previous Answer: -2 # 2	Previous Answer: 2 # 4	7. Simplify the logarithm without a calculator.	8. Simplify the logarithm without a calculator.	$\log_9 3$ $10_9(9^{1/2})$ 1/2	$\log_6 6$ $10_6 6^1$ 1	Previous Answer: 3 # 3	Previous Answer: 5 # 1	9. Simplify the logarithm without a calculator.	10. Simplify the logarithm without a calculator.	$\log_8 2$ $10_8(8^{1/3})$ 1/3	$\log_3 81$ $10_3(3^4)$ 4
Previous Answer: -2 # 2	Previous Answer: 2 # 4												
7. Simplify the logarithm without a calculator.	8. Simplify the logarithm without a calculator.												
$\log_9 3$ $10_9(9^{1/2})$ 1/2	$\log_6 6$ $10_6 6^1$ 1												
Previous Answer: 3 # 3	Previous Answer: 5 # 1												
9. Simplify the logarithm without a calculator.	10. Simplify the logarithm without a calculator.												
$\log_8 2$ $10_8(8^{1/3})$ 1/3	$\log_3 81$ $10_3(3^4)$ 4												

Previous Answer: 1/3
3. Simplify the logarithm without a calculator.
$\log_9 81$ $10_9 9^2$ 2
Previous Answer: 1/4
5. Simplify the logarithm without a calculator.
$\log_{10} 1$ 0

This is a great activity to use when reviewing how to evaluate logarithms using properties, without a calculator.

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

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

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

Special Logarithms: The Natural Log has a base of e

Evaluating Logs with a Calculator - Round to the nearest thousandth	
\log_6	\log_{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

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EVALUATING LOGARITHMS

Printable Maze

Self-Checking

Evaluating Logarithms Maze

Directions: Evaluate each logarithm. The answer will lead you to the next question. Don't forget to show your work!

Answer key included

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EXPONENTIAL & LOGARITHMIC FUNCTIONS

Algebra 2 Guided Notes

TRANSFORMATIONS OF LOGARITHMIC FUNCTIONS

GRAPHING EXPONENTIAL FUNCTIONS

EXPONENTIAL FUNCTIONS WITH BASE E

The Natural Base e

Exponential Growth: $f(x) = e^x$

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

Answer key included

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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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