

keep scrolling to get
a sneak peek!

Help your Algebra students
practice applying various skills to
logarithmic functions.

This bundle of circuit worksheets
will help your students review
these skills throughout the unit,
while also being able to self
check their work!

LOGARITHMIC FUNCTIONS DIFFERENTIATED CIRCUITS

Unit Worksheet Bundle

The image shows three overlapping circuit worksheet pages. The top page is titled 'EVALUATING LOGS WITHOUT A CALCULATOR' and contains a path of numbers: 10 → 4 → 8 → 2 → 7 → 3. The middle page is titled 'SOLVING LOGARITHMIC EQUATIONS' and contains two problems: 7. $\log_5 x = \log_5 125$ with solution $x = 125$, and 9. $\log(x+4) - \log 2 = 1$ with solution $110 = x$. The bottom page is titled 'EXPANDING & CONDENSING LOGARITHMIC EXPRESSIONS' and contains two problems: 1. Expand $\log_6(xyz)$ with solution $\log_6 x + \log_6 y + \log_6 z$, and 3. Expand $\log_{10}(\frac{x^4}{y^2z})$ with solution $4 \log x - 2 \log y - \log z$. Each page includes a 'Previous Answer' field and a 'Helpful Hints' section.



5 TOPICS + 2 VERSIONS EACH + ANSWER KEYS

© Malia Rivera, 2026

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.

Logarithmic Functions Unit Circuit Worksheets

CONVERTING BETWEEN LOGARITHMIC & EXPONENTIAL CIRCUIT

Previous Answer: $\log_a p = p$ # _____

7. Rewrite in exponential form.
 $\log x = r$

Previous Answer: $\log_a n = m$ # _____

8. Rewrite in exponential form.
 $\log_m n = p$

Name: _____

SOLVING LOG & EXPONENTIAL EQUATIONS 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: $x = (\ln 5)/4$ # _____

1. $e^{2x} = e^x + 2$

Previous Answer: $x = \ln 12 / \ln 7$ # _____

2. $\log_3 x = -2$

Previous Answer: $x = 5$ # _____

3. $\ln(3x - 4) = 1$

Previous Answer: $x = 6$ # _____

4. $2^{x+1} = 16$

Previous Answer: $x = e^5 - 1$ # _____

5. $3e^{4x} = 15$

6. $\log(2x + 1) = \log 1$

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

Each Logarithmic Function Circuit *includes*:

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

How are you feeling about this topic? Circle one:

© Malia Rivera, 2026

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

Basic Log Rules:	Product Property: $\log_b(m \cdot n) = \log_b m + \log_b n$
$\log_a 1 = 0$	Quotient Property: $\log_b\left(\frac{m}{n}\right) = \log_b m - \log_b n$
$\log_a a = 1$	Power Property: $\log_b m^n = n \log_b m$
$\log_a a^x = x$	

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

Logarithmic Functions Unit Circuits Bundle

skills covered:

Evaluating with Properties

Expanding & Condensing

Converting Forms

**Solving with & without
exponentiating**

Name: **Answer Key** Date: _____

SOLVING LOGARITHMIC EQUATIONS 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 → 4 → 8 → 6 → 2 → 9 → 5 → 3 → 10 → 7 → 1

Previous Answer: $x = 2\sqrt{25}$	# <u>7</u>	Previous Answer: $x = \pm\sqrt{10}$	# <u>6</u>
1. $\log_4(3x + 5) = \log_4(x + 1)$ $\begin{array}{r} 3x + 5 = x + 1 \\ -x \quad -x \\ \hline 2x + 5 = 1 \\ -5 \quad -5 \\ \hline 2x = -4 \\ \frac{2x}{2} = \frac{-4}{2} \\ x = -2 \end{array}$ NO SOLUTION!		2. $\log_5(x - 2) = 2$ $\begin{array}{r} 5^2 = x - 2 \\ 25 = x - 2 \\ +2 \quad +2 \\ \hline 27 = x \end{array}$	
Previous Answer: $x = 4$	# <u>5</u>	Previous Answer: No solution	# <u>1</u>
3. $\log(x + 6) - \log x = 1$ $\begin{array}{r} \log\left(\frac{x+6}{x}\right) = 1 \\ 10^1 = \frac{x+6}{x} \\ 10x = x+6 \\ -x \quad -x \\ \hline 9x = 6 \\ \frac{9x}{9} = \frac{6}{9} \\ x = \frac{2}{3} \end{array}$ $x = \frac{2}{3}$		4. $2\log_3(x - 1) = \log_3 16$ $\begin{array}{r} \sqrt{(x-1)^2} = \sqrt{16} \\ x-1 = \pm 4 \\ x-1 = 4 \quad x-1 = -4 \\ +1 \quad +1 \quad +1 \quad +1 \\ \hline x = 5 \quad x = -3 \end{array}$ $x = 5$ Extraneous	
Previous Answer: $x = 12$	# <u>9</u>		
5. $\log_4(x + 5) = \log_4(x - 1)$	# <u>8</u>		

Logarithmic Functions Unit Circuits Bundle

standards covered:

CCSS: HSA-SSE.B.3, HSF-LE.A.4, HSF-BF.B.5

TEKs: A2.5.C, A2.5.D, A2.5.E, P.5.G

Name: _____ Date: _____

Answer Key

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: $5^{-2} = 1/25$ # <u>5</u> 1. Rewrite in logarithmic form. $b^x = y$ $\log_b y = x$	Previous Answer: $\ln(n) = m$ # <u>6</u> 2. Rewrite in exponential form. $4 = \log_3 81$ $\log_3 81 = 4$ $3^4 = 81$
Previous Answer: $2^6 = 64$ # <u>8</u> 3. Rewrite in exponential form. $\ln(a) = x$ $\log_e a = x$ $e^x = a$	Previous Answer: $\log_m n = -2$ # <u>9</u> 4. Rewrite in logarithmic form. $10^x = y$ $\log_{10} y = x$ $\log y = x$
Previous Answer: $4^2 = 16$ # <u>7</u> 5. Rewrite in logarithmic form. $a^m = e^m$	Previous Answer: $4^2 = 16$ # <u>10</u> 6. Rewrite in logarithmic form. $a^m = e^m$

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: _____

SOLVING LOG & EXPONENTIAL EQUATIONS 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: $x = (\ln 5)/4$ # _____	Previous Answer: $x = \ln 12 / \ln 7$ # _____
1. $e^{2x} = e^x + 2$	2. $\log_3 x = -2$
Previous Answer: $x = 5$ # _____	Previous Answer: $x = 6$ # _____
3. $\ln(3x - 4) = 1$	4. $2^{x+1} = 16$

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

EXPANDING & CONDENSING LOGS CIRCUIT

Previous Answer: $\log_5\left(\frac{2}{3}\right)$ # _____	Previous Answer: $3\log_2 x - \log_2 y$ # _____
7. Expand: $\log_2\left(\frac{x^3}{y}\right)$	8. Condense: $3\log_7 x + \log_7 y$

Name: Answer Key _____ Date: _____	
<h3>EXPANDING & CONDENSING LOGS CIRCUIT</h3>	
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 → 6 → 7 → 8 → 4 → 5 → 10 → 9 → 3 → 2 → 1	
Previous Answer: $\log_5 x(x-1)$ # 2	Previous Answer: $2\log_2 x - \frac{1}{2}\log_2 y$ # 3
1. Expand: $\log_3\left(\frac{x^2y}{z}\right)$ $2\log_3 x + \log_3 y - \log_3 z$	2. Condense: $\log_5 x + \log_5(x-1)$ $\log_5 x(x-1)$
Previous Answer: $\log_6(3x)$ # 9	Previous Answer: $\log_7\left(\frac{x^2}{\sqrt{y}}\right)$ # 8
3. Expand: $\log_2\left(\frac{x^2}{\sqrt{y}}\right)$ $2\log_2 x - \frac{1}{2}\log_2 y$	4. Expand: $\log_4(16x^2y)$ $\log_4 16 + 2\log_4 x + \log_4 y$ $\log_4 4^2 + 2\log_4 x + \log_4 y$

Previous Answer: $2\log_8 x + 6\log_8 y$
9. Condense: $\log_2 x + \log_2 y$

Helpful Hints: Use these hints
Basic Log Rules: $\log_a 1 = 0$ $\log_a a = 1$ $\log_a a^x = x$

This is a great activity to use when reviewing logarithmic function skills.

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

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



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!

Did you know you could get **FREE** money from TPT??

All you need to do is leave feedback on the product after you purchase. [Click here](#) to leave reviews and earn credits towards your next TPT purchase!

let's connect!



Follow my TPT store



Follow my Instagram



Email me