keep scrolling to get a sneak peek!

Help your Algebra 2 and Pre-Calculus students practice **expanding & condensing logs.** Students will be eager to get the self-checking benefits from this circuit activity!

EXPAND & CONDENSE LOGARITHMS
Differentiated Circuit Worksheet

Math with Ms. Rivera

2 versions + answer key included

why do you need this?

Expanding & Condensing Logarithms Circuit

🖍️ 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.

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EXPANDING & CONDENSING LOGS CIRCUIT

Name: _____ Date: _____

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.

$1 \rightarrow$ ___ $\rightarrow$ ___ $\rightarrow$ ___ $\rightarrow$ ___ $\rightarrow$ ___

Previous Answer: $\log_5 x(x-1)$ #___

1. Expand: $\log_3 \left(\frac{x^2 y}{z}\right)$

Previous Answer: $\log_6 (3x)$ #___

3. Expand: $\log_2 \left(\frac{x^2}{\sqrt{y}}\right)$

Previous Answer: $2 + 2\log_4 x + \log_4 y$ #___

5. Condense: $\log_3 x + \log_3 y - \frac{1}{2}\log_3 z$

2. Cond...

4. Expa...

6. Cond...

EXPANDING & CONDENSING LOGS CIRCUIT

Previous Answer: $3\log_2 x - \log_2 y$

8. Condense: $3\log_7 x + \log_7 y$

Previous Answer: $\log_5 \left(\frac{2}{3}\right)$

7. Expand: $\log_2 \left(\frac{x^3}{y}\right)$

Previous Answer: $\log_3 \left(\frac{x}{y^2}\right)$

10. Expand: $\log_8 (x^2 y^6)$

Previous Answer: $2\log_8 x + 6\log_8 y$ #___

9. Condense: $\log_2 x + \log_2 y - \log_2 z$

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

Basic Log Rules:

$\log_a 1 = 0$

$\log_a a = 1$

Product Property: $\log_b (m \cdot n) =$

Quotient Property: $\log_b \left(\frac{m}{n}\right) =$

Power Property: $\log_b m^n =$

Expanding & Condensing Logs Circuit *includes:*

Challenge: Simplify completely and write your final answer as a single logarithm.
$$\log_3\left(9x^2\right) - 2\log_3 x + \log_3 4$$

How are you feeling about this topic? Circle one:

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

Basic Log Rules:

$\log_a 1 = 0$

$\log_a a = 1$

$\log_a a^x = x$

Product Property: $\log_b(m \cdot n) = \log_b m \cdot \log_b n$

Quotient Property: $\log_b\left(\frac{m}{n}\right) = \log_b m - \log_b n$

Power Property: $\log_b m^n = n \log_b m$

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

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Expanding & Condensing Logs Circuit

standards covered:

CCSS: HSA-SSE.B.3

TEKs: P.5.G

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.

Students start with the first question.

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

Name: _____ Date: _____

EXPANDING & CONDENSING LOGS 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.

$1 \rightarrow$ ____ $\rightarrow$ ____ $\rightarrow$ ____ $\rightarrow$ ____ $\rightarrow$ ____ $\rightarrow$ ____ $\rightarrow$ ____ $\rightarrow$ ____ $\rightarrow$ ____ $\rightarrow 1$

Previous Answer: $\log_5\left(\frac{x^2 z}{y^3}\right)$ #____	Previous Answer: $4\log x - 2\log y - \log z$ #____
1. Expand: $\log_6(xyz)$	2. Condense: $2\log_5 x - 3\log_5 y + \log_5 z$
Previous Answer: $\log_2\left(\frac{xy}{z}\right)$ #____	Previous Answer: $\log_7(x^3 y)$ #____
3. Expand: $\log_{10}\left(\frac{x^4}{y^2 z}\right)$	4. Expand: $\log_4\left(\frac{4}{x}\right)$

how to use this resource

This is a great activity to use when reviewing how to expand and condense logarithms using properties.

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

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

Name: **Answer Key** Date: _____

EXPANDING & CONDENSING LOGS 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.

$1 \to$ **6** $\to$ **7** $\to$ **8** $\to$ **4** $\to$ **5** $\to$ **10** $\to$ **9** $\to$ **3** $\to$ **2** $\to 1$

Previous Answer: $\log_5 x(x-1)$ #**2**	Previous Answer: $2\log_2 x - \frac{1}{2}\log_2 y$ #**3**
1. Expand: $\log_3 \left(\frac{x^2 y}{z}\right)$ $2\log_3 x + \log_3 y - \log_3 z$	2. Condense: $\log_5 x + \log_5 (x-1)$

Previous Answer: $\log_6 (3x)$
3. Expand: $\log_2 \left(\frac{x^2}{\sqrt{y}}\right)$ $2\log_2 x - \frac{1}{2}\log_2 y$

Previous Answer: $2 + 2\log_4 x$
5. Condense: $\log_3 x + \log_3 y - \log_3 \left(\frac{xy}{\sqrt{z}}\right)$

EXPANDING & CONDENSING LOGS CIRCUIT

Previous Answer: $\log_5 \left(\frac{2}{3}\right)$ #**6**	Previous Answer: $3\log_2 x - \log_2 y$ #**7**
7. Expand: $\log_2 \left(\frac{x^3}{y}\right)$ $3\log_2 x - \log_2 y$	8. Condense: $3\log_7 x + \log_7 y$ $\log_7 x^3 y$
Previous Answer: $2\log_8 x + 6\log_8 y$ #**10**	Previous Answer: $\log_3 \left(\frac{x}{y^2}\right)$ #**5**
9. Condense: $\log_2 x + \log_2 y - \log_2 z$ $\log_2 \left(\frac{xy}{z}\right)$	10. Expand: $\log_8 (x^2 y^6)$ $2\log_8 x + 6\log_8 y$

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Self-Checking
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Algebra 2 Guided Notes
Answer key included
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hey there!

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