

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.

Solving Exponential Equations Circuit

Name: _____ Date: _____

SOLVING 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: $x = 2/3$	# _____	Previous
1. $2^x = 32$		2. $\frac{1}{3}^x =$
Previous Answer: $x = 5$	# _____	Previous
3. $5^{x+1} = 125$		4. $4^{2x} =$
Previous Answer: $x = 1/4$	# _____	Previous
5. $3^{x-2} = 9^{x-3}$		6. $\frac{1}{2}^x = 1$

Previous Answer: $x = -4$	# _____	Previous Answer: $x = 4$
7. $2^x = \frac{1}{16}$		8. $3^x = \frac{1}{27}$
Previous Answer: $x = 1$	# _____	Previous Answer: $x = 5$
9. $3^{x+1} = 1$		10. $5^x = 1$

Helpful Hints: Use these hints to help you solve the problems.
Make the bases the same, then set the exponents equal to each other.

Exponent Rules:
 $a^{-n} = \frac{1}{a^n}$
 $a^m \cdot a^n = a^{m+n}$
 $\frac{a^m}{a^n} = a^{m-n}$

Solving Exponential Equations Circuit *includes:*

Challenge: Solve the exponential equation below. Show your work.

$$9^{x+1} = 27(3^x)$$

How are you feeling about this topic? Circle one: 😊 😐 😱 😞

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

Make the bases the same, then set the exponents equal to each other.

Exponent Rules:

$a^n \cdot a^m = a^{n+m}$	$a^{-n} = \frac{1}{a^n}$	$a^1 = a$
$(a^n)^m = a^n \cdot m$	$\frac{1}{a^{-n}} = a^n$	$a^0 = 1$

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

Solving Exponential Equations Circuit

standards covered:

CCSS: HSF-BF.B.5

TEKs: A2.5.CDE

SOLVING EXPONENTIAL EQUATIONS CIRCUIT

Previous Answer: $x = -4$ # <u>6</u> 7. $2^{x+2} = \frac{1}{16}$ $2^{x+2} = \frac{1}{2^4}$ $2^{x+2} = 2^{-4}$ $x+2 = -4$ $x = -6$	Previous Answer: $x = 3/2$ # <u>4</u> 8. $3^{x+1} = 27^x$ $3^{x+1} = 3^{3x}$ $x+1 = 3x$ $1 = 2x$ $x = 1/2$
Previous Answer: $x = 4$ # <u>5</u> 9. $6^x = \frac{1}{36^{x-1}}$ $6^x = 36^{-(x-1)}$ $6^x = 6^{-2(x-1)}$ $x = -2x+2$ $3x = 2$ $x = 2/3$	Previous Answer: $x = 3$ # <u>2</u> 10. $\frac{1}{5}^{x-1} = 125^x$ $\frac{1}{5}^{x-1} = 5^{3x}$ $\frac{1}{5}^{x-1} = \frac{1}{5}^{-3x}$ $x-1 = -3x$ $4x = 1$ $x = 1/4$

Challenge: Solve the exponential equation below. Show your work.

$9^{x+1} = 27(3^{4x})$
 $9^{x+1} = 3^3 \cdot 3^{4x}$
 $3^{2(x+1)} = 3^{3+4x}$

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 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: $x = 2/3$ # _____	Previous Answer: $x = 1/2$ # _____
1. $2^x = 32$	2. $\frac{1}{3}^x = \frac{1}{27}$
Previous Answer: $x = 5$ # _____	Previous Answer: $x = -6$ # _____
3. $5^{x+1} = 125$	4. $4^{2x} = 64$

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: _____

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

Previous Answer: $x = -8$ # 9	Previous Answer: $x = -3$ # 8
1. $3^x = 27$ $3^x = 3^3$ $x = 3$	2. $2 \cdot 2^{x-1} = 16$
Previous Answer: $x = 3$	Previous Answer: $x = -4$ # 6
3. $5^x = 25$ $5^x = 5^2$ $x = 2$	7. $2^{x+2} = \frac{1}{16}$ $2^{x+2} = 2^{-4}$ $x+2 = -4$ $x = -6$
Previous Answer: $x = 0$	Previous Answer: $x = 3/2$ # 4
5. $7^{2x} = 49$ $7^{2x} = 7^2$ $2x = 2$ $x = 1$	8. $3^{x+1} = 27^x$ $3^{x+1} = 3^{3x}$ $x+1 = 3x$ $1 = 2x$ $x = 1/2$
Previous Answer: $x = 4$ # 5	Previous Answer: $x = 3$ # 2
9. $6^x = \frac{1}{36^{x-1}}$ $6^x = 36^{-(x-1)}$ $6^x = 6^{-2(x-1)}$ $x = -2x+2$ $3x = 2$ $x = 2/3$	10. $\frac{1}{5}^{x-1} = 125^x$ $\frac{1}{5}^{x-1} = 5^{3x}$ $\frac{1}{5}^{x-1} = \frac{1}{5}^{-5x}$ $x-1 = -3x$ $4x = 1$ $x = 1/4$

This is a great activity to use when reviewing how to write quadratic equations in vertex form.

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

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

You may also enjoy ...

SOLVING EXPONENTIAL EQUATIONS

Algebra 2 Guided Notes

This thumbnail shows a page titled "SOLVING EXPONENTIAL EQUATIONS" with sections for "Property of Equality", "Steps for Solving Exponential Equations (Same Base)", and "Directions: Solve each equation. Show your work!". It includes handwritten notes and examples such as $4^x = 4^6$ and $2^x = 4$. A circular logo for "MATH with Ms. Rivera" is in the bottom left, and the text "Answer key included" is at the bottom.

© Malia Rivera, 2023

EXPONENTIAL & LOGARITHMIC FUNCTIONS

Algebra 2 Guided Notes

This thumbnail shows a page titled "EXPONENTIAL & LOGARITHMIC FUNCTIONS" with sections for "TRANSFORMATIONS OF LOGARITHMIC FUNCTIONS", "GRAPHING EXPONENTIAL FUNCTION", and "EXPONENTIAL FUNCTIONS WITH BASE E". It includes handwritten notes, a graph of an exponential function, and a section about the natural base e . A circular logo for "MATH with Ms. Rivera" is in the bottom left, and the text "Answer key included" is at the bottom.

© Malia Rivera, 2023

SOLVING EXPONENTIAL & LOGARITHMIC EQUATIONS

COLOR BY NUMBER WORKSHEET

This thumbnail shows a worksheet titled "SOLVING EXPONENTIAL & LOGARITHMIC EQUATIONS" with a grid for coloring. The grid contains a heart shape. The worksheet includes equations like $7x + 3 = \log 38$ and $4^x + 5 = 4^x + 1$. A color key at the bottom identifies numbers with colors: 11 (Blue), 0.203 (Black), 5 (Red), -2 (Green), -1 (Pink), 3 (Red), 8 (Pink), 1 (Purple), 1/4 (Green). A circular logo for "MATH with Ms. Rivera" is in the bottom left, and the text "Answer key included" is at the bottom.

© Malia Rivera, 2024

Free Algebra Activities!

When you join my email list, I'll send you a free Algebra print & digital self-checking activities. There is an Algebra 1 and Algebra 2 version!

You'll also be getting exclusive freebies and content to help your Algebra students be successful this school year!

check it out!

Answer Key
Name: _____ Date: _____
ADDING & SUBTRACTING RATIONAL EXPRESSIONS
Directions: Add or subtract the rational expressions. Show your work.

Solving Systems of Equations
Date: _____
Solve systems of equations using substitution or elimination. Check your solution.
2. $2x - 6y = -18$
 $x = 3y - 9$
4. $2x + 6y = -1$
 $y = -2x + 3$

Answer Key
Solving Systems of Equations
Date: _____
Solve systems of equations using substitution or elimination. Check your solution.
2. $2x - 6y = -18$
 $x = 3y - 9$
 $2(3y - 9) - 4y = -18$
 $6y - 18 - 4y = -18$
 $-18 = -18$
infinitely many solutions
 $y = 2 + 5$
 $y = 7$
 $(2, 7)$

Multiplying & Dividing Rational Expressions
Date: _____
Directions: Multiply or divide the rational expressions. Show your work.

Rational Expression Operations - Addition & Subtraction
Directions: Answer each question and type the question number with the matching answer in the answer column to the right.

#	Question	Answer	Type the matching question numbers here
1	$\frac{5}{x} + \frac{3}{x+1}$	$\frac{2x+1}{x+2}$	
2	$\frac{2}{x+4} - \frac{x^2}{x^2-16}$	$-\frac{1}{x^2-1}$	
3	$\frac{x+2}{x^2+4x+4} + \frac{2x}{x+2}$	$\frac{2x^2+2x+5}{x^2+x-2}$	
4	$\frac{x}{x-2} + \frac{3}{x-1}$	$-\frac{x^2+2x-8}{x^2-16}$	
5	$\frac{x}{4x+8} - \frac{1}{x^2+2x}$	$\frac{8x+5}{x^2+1}$	
6	$\frac{x+2}{x-1} + \frac{x-1}{x+2}$	$\frac{x^2-3x+7}{x^2-4}$	
7	$\frac{2x+1}{x^2-4} + \frac{x-3}{x+2}$	$\frac{x^2+2x-6}{x^2-3x+2}$	
8	$\frac{x^2+2x}{x^2-1} - \frac{x+1}{x-1}$	$\frac{x-2}{4x}$	

(c) Malia Rivera, 2024



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