

keep scrolling to
get a sneak peek!

Help your Algebra students practice applying the product & power exponent rules. Students will be eager to get the self-checking benefits from this circuit activity!

EXPONENT RULES: PRODUCT & POWER

Differentiated Circuit Worksheet

The image shows two overlapping circuit worksheet pages. The top page is titled "EXPONENT RULES: POWER & PRODUCT" and includes a path of numbers: 1 → 4 → 3 → 8 → 5 → 2 → 7 → 6. The bottom page is titled "EXPONENT RULES: POWER & PRODUCT" and includes a path of numbers: 1 → 4 → 3 → 8 → 5 → 2 → 7 → 6. Both pages contain math problems and solutions. The bottom page shows a problem: "1. Simplify. Write your answer using exponents. $10^3 \cdot 10^2$ " with the solution $10^{3+2} = 10^5$ and the answer 10^5 boxed. Another problem shows "2. Simplify. Write your answer using exponents. $3^6 \cdot 3^4$ " with the solution $3^{6+4} = 3^{10}$ and the answer 3^{10} boxed. The bottom page also shows a problem: "3. Simplify. Write your answer using exponents. $16x^4$ " with the answer $16x^4$ boxed. The top page shows a problem: "2. Simplify. $x^5 \cdot x^8$ " with the answer x^{12} boxed. The bottom page also shows a problem: "4. Simplify. $x^3 \cdot x \cdot x$ " with the answer x^5 boxed. The bottom page also shows a problem: "1. Simplify. Write your answer using exponents. $x^2 \cdot x^3$ " with the answer x^5 boxed. The bottom page also shows a problem: "2. Simplify. Write your answer using exponents. $x^2 \cdot x^3$ " with the answer x^5 boxed. The bottom page also shows a problem: "3. Simplify. Write your answer using exponents. $x^2 \cdot x^3$ " with the answer x^5 boxed. The bottom page also shows a problem: "4. Simplify. Write your answer using exponents. $x^2 \cdot x^3$ " with the answer x^5 boxed.



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.

Exponent Rules: Product & Power Rule Circuit

Name: _____ Date: _____

EXPONENT RULES: POWER & PRODUCT RULE 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: $36x^{12}$	# _____	Previous Answer: x^{42}
1. Simplify. $x^5 \cdot x^8$	2. Simplify. _____	8. Simplify. Write your answer using exponents. $[(-3)^5]^4$
Previous Answer: $16x^4y^4$	# _____	Previous Answer: x^{17}
3. Simplify. $(x^7)^2$	4. Simplify. _____	9. Simplify. Write your answer using exponents. $x^0 \cdot x^9$
Previous Answer: $81x^{17}$	# _____	Previous Answer: x^8
5. Simplify. $-(3xy^3)^2$	6. Simplify. _____	10. Simplify. Write your answer using exponents. $(x^3)^4 \cdot x^5$

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

Product Rule:
 $a^x \cdot a^y = a^{x+y}$

"When you multiply terms with exponents."

Exponent Rules: Product & Power Rule *includes:*

Challenge: Fill in the number(s) that would make the following statements true.	
a) $(3x^{[?]})y^{[?]} = 9y^8$	b) $(2x)^{[?]} \cdot (x^4)^3 = 8x^{[?]}$
How are you feeling about this topic? Circle one: <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	
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Helpful Hints: Use these hints to help you solve the problems.	
Product Rule: $a^x \cdot a^y = a^{x+y}$ "When you multiply terms with exponents, you add the exponents."	Power Rule: $(a^x)^y = a^{x \cdot y}$ "When you raise a power to a power, you multiply the exponents."
How are you feeling about this topic? Circle one: <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	

- ✓ 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

Exponent Rules: Product & Power Rules

standards covered:

CCSS: 8.EE.A.1

TEKs: A1.11.B

VA SOLs: EO.A.2.a

EXPONENT RULES: POWER & PRODUCT RULE CIRCUIT

Previous Answer: x^8 7. Simplify. # 2 $y^{10} \cdot y^2 \cdot y^4$ y^{10+2+4} y^{16}	Previous Answer: x^{14} 8. Simplify. # 3 $(3x^3)^4 \cdot x^5$ $3^4 x^{3 \cdot 4} \cdot x^5$ $81 x^{12} \cdot x^5$ $81 x^{12+5}$ $81 x^{17}$
Previous Answer: $10y^{34}$ 9. Simplify. # 10 $4x^2 \cdot (3x^5)^2$ $4x^2 \cdot 3^2 x^{5 \cdot 2}$ $4x^2 \cdot 9x^{10}$ $4 \cdot 9 \cdot x^{2+10}$ $36x^{12}$	Previous Answer: $64x^{18}y^{12}$ 10. Simplify. # 6 $10y^4 \cdot (y^5)^6$ $10y^4 \cdot y^{5 \cdot 6}$ $10y^4 \cdot y^{30}$ $10y^{4+30}$ $10y^{34}$
Challenge: Fill in the number(s) that would make the following statements true.	
a) $(3x^{[?]})^2 (y^{[?]})^3 = 9y^8$ 0 4 2	b) $(2x)^{[?]} \cdot (x^4)^3 = 8x^{[?]}$ 2 1

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: _____

EXPONENT RULES: POWER & PRODUCT RULE 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: $36x^{12}$ # _____	Previous Answer: $-9x^2y^6$ # _____
1. Simplify. $x^5 \cdot x^8$	2. Simplify. $x^3 \cdot x \cdot x^4$
Previous Answer: $16x^4y^4$ # _____	Previous Answer: x^{13} # _____
3. Simplify. $(x^7)^2$	4. Simplify. $(2xy)^4$

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

This is a great activity to use when reviewing how simplify exponents with the product & power rules.

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

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

Name: Answer Key Date: _____

EXPONENT RULES: POWER & PRODUCT RULE 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** → **3** → **8** → **5** → **2** → **7** → **6** → **10** → **9** → 1

Previous Answer: $36x^{12}$ # 9	Previous Answer: $-9x^2y^6$ # 5
1. Simplify. $x^5 \cdot x^8$ x^{5+8} x^{13}	2. Simplify.

Previous Answer: x^8 # 2	Previous Answer: x^{14} # 3
7. Simplify. $y^{10} \cdot y^2 \cdot y^4$ y^{10+2+4} y^{16}	8. Simplify. $(3x^3)^4 \cdot x^5$ $3^4 x^{3 \cdot 4} \cdot x^5$ $81 x^{12} \cdot x^5$ $81 x^{12+5}$ $81 x^{17}$

Previous Answer: $10y^{34}$ # 10	Previous Answer: $64x^{18}y^{12}$ # 6
9. Simplify. $4x^2 \cdot (3x^5)^2$ $4x^2 \cdot 3^2 x^{5 \cdot 2}$ $4x^2 \cdot 9x^{10}$ $4 \cdot 9 \cdot x^{2+10}$ $36x^{12}$	10. Simplify. $10y^4 \cdot (y^5)^6$ $10y^4 \cdot y^{5 \cdot 6}$ $10y^4 \cdot y^{30}$ $10y^{4+30}$ $10y^{34}$

Previous Answer: $16x^4y^4$	Previous Answer: $81x^{17}$
3. Simplify. $(x^7)^2$ $x^{7 \cdot 2}$ x^{14}	5. Simplify. $-(3xy^3)^2$ $-(3^2 x^2 y^{3 \cdot 2})$ $-9x^2y^6$

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LAWS OF EXPONENTS POWER RULE

Worksheet

Math with Ms. Rivera

Answer key included

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EXPONENT RULES: POWER & PRODUCT

Digital & Print Activity Pack

5 Activities

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LAW OF EXPONENTS: PRODUCT RULE

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Self-Checking

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check it out!

Answer Key
Name: _____ Date: _____
ADDING & SUBTRACTING RATIONAL EXPRESSIONS
Directions: Simplify each rational expression. Show your work.

SOLVING SYSTEMS OF EQUATIONS
Date: _____
Solve each system of equations using substitution or elimination. Check your solution.

ANSWER KEY
SOLVING SYSTEMS OF EQUATIONS
Date: _____
Solve each system of equations using substitution or elimination. Check your solution.

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	$\frac{x^2+2x}{x^2-1} - \frac{x+1}{x-1}$	$\frac{x-2}{4x}$	

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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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