

Why do you need this?

Factoring Polynomials 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.

Name: _____ Date: _____

FACTORIZING POLYNOMIALS 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: $4x^2(x^5 - 6)(x^5 - 2)$ # _____	2. Factor completely. $x^3 - 7x^2 + 10x$	Previous Answer: $4x(x+3)(x-1)$ # _____	7. Factor completely. $x^3 - 5x^2 - 9x + 45$
Previous Answer: $x(x-5)(x-2)$ # _____	3. Factor completely. $8x^3 - 16x^2 + 8x$	Previous Answer: $(x-5)(x^2+5x+25)$ # _____	9. Factor completely. $x^4 - 3x^2 - 28$
Previous Answer: $(x+8)(x^2-8x+64)$ # _____	5. Factor completely. $9x^6 - 6561x^3$	Previous Answer: $2(x+3)(x-2)$ # _____	10. Factor completely. $x^3 - 125$

8. Factor completely.
 $4x^4 - x^2$

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

Always look to see if there is a GCF first.

Sum of Cubes: $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

Difference of Cubes: $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$

Factor by grouping

Factoring Polynomials *includes:*

Challenge: Factor completely: $6x^4 - 24x^2y^2 + 18y^4$

How are you feeling about this topic? Circle one:

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

Always look to see if there is a GCF first!

Sum of Cubes: $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Difference of Cubes: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

4 term polynomials → Factor by grouping

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

Factoring Polynomials Circuit

standards covered:

CCSS: HSA-SSE.A.1a,
HSA-SSE.B.3, HSA-SSE.B3a

TEKs: A2.7.D, A2.7.E

VA SOLs: EO.All.1c

FACTORING POLYNOMIALS CIRCUIT

Previous Answer: $(2x^2 - 5)(2x^2 + 5)$ # 4

7. Factor completely.
 $4x^{12} - 32x^7 + 48x^2$
 $4x^2(x^{10} - 8x^5 + 12)$
 $4x^2(x^5 - 2)(x^5 - 6)$

Previous Answer: $(2x-7)(4x^2+14x+49)$ # 9

8. Factor completely.
 $24x^3 - 28x^2 + 8x$
 $4x(6x^2 - 7x + 2)$
 $4x(6x^2 - 4x - 3x + 2)$
 $4x(2x(3x-2) - 1(3x-2))$
 $4x(2x-1)(3x-2)$

Previous Answer: $9x^2(x+1)(x-3)$ # 10

9. Factor completely.
 $8x^3 - 343$
 $(2x-7)(4x^2+14x+49)$

Previous Answer: $8x^3(x-1)^2$ # 3

10. Factor completely.
 $9x^4 - 18x^3 - 27x^2$
 $9x^2(x^2 - 2x - 3)$
 $9x^2(x-3)(x+1)$

Challenge: Factor completely: $6x^4 - 24x^2y^2 + 18y^4$
 $6(x^4 - 4x^2y^2 + 3y^4)$
 $6(x^4 - 3x^2y^2 - x^2y^2 + 3y^4)$

how this circuit resource works

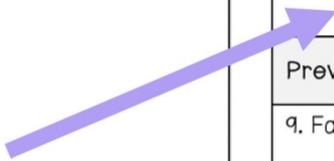
Then search for their answer on the worksheet. Once the answer is found, students complete the problem below it.

Students can track their path at the top.



Previous Answer: $4x(x + 3)(x - 1)$ #____	Previous Answer: $(x^2 - 7)(x^2 + 4)$ #____
7. Factor completely. $x^3 - 5x^2 - 9x + 45$	8. Factor completely. $4x^4 - x^2$
Previous Answer: $(x - 5)(x^2 + 5x + 25)$ #____	Previous Answer: $2(x + 3)(x - 2)(x + 2)$ #____
9. Factor completely. $x^4 - 3x^2 - 28$	10. Factor completely. $x^3 - 125$
Helpful Hints: Use these hints to help you solve the problems.	

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: _____

FACTORING POLYNOMIALS 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** → **10** → **9** → **8** → **2** → **5** → **6** → **4** → **7** → 1

Previous Answer: $4x^2(x^5 - 6)(x^5 - 2)$ # 7	Previous Answer: $4x(3x - 2)(2x - 1)$ # 8
1. Factor completely. $x^3 - 7x^2 + 10x$ $x(x^2 - 7x + 10)$ $x(x - 5)(x - 2)$	2. Factor completely.
Previous Answer: $x(x - 5)(x - 2)$	
3. Factor completely. $8x^3 - 16x^2 + 8x$ $8x^3(x^2 - 2x + 1)$ $8x^3(x - 1)^2$	
Previous Answer: $(x + 8)(x^2 - 64)$	
5. Factor completely. $9x^6 - 6561x^3$ $9x^3(x^3 - 729)$ $9x^3(x - 9)(x^2 + 9x + 81)$	

Previous Answer: $(2x^2 - 5)(2x^2 + 5)$ # 4	Previous Answer: $(2x - 7)(4x^2 + 14x + 49)$ # 9
7. Factor completely. $4x^{12} - 32x^7 + 48x^2$ $4x^2(x^{10} - 8x^5 + 12)$ $4x^2(x^5 - 2)(x^2 - 6)$	8. Factor completely. $24x^3 - 28x^2 + 8x$ $4x(6x^2 - 7x + 2)$ $4x(6x^2 - 4x - 3x + 2)$ $4x(2x(3x - 2) - 1(3x - 2))$ $4x(2x - 1)(3x - 2)$
Previous Answer: $9x^2(x + 1)(x - 3)$ # 10	Previous Answer: $8x^3(x - 1)^2$ # 3
9. Factor completely. $8x^3 - 343$ $(2x - 7)(4x^2 + 14x + 49)$	10. Factor completely. $9x^4 - 18x^3 - 27x^2$ $9x^2(x^2 - 2x - 3)$ $9x^2(x - 3)(x + 1)$

This is a great activity to use when reviewing how to factor polynomials with degree 3 or higher & special patterns.

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

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

You may also enjoy ...

FACTORING POLYNOMIALS

Algebra 2 Guided Notes

FACTORING POLYNOMIALS

Directions: Factor each polynomial completely by taking out the GCF.

$3x^4 + 9x^3 - 2x^2 - 6x$

$3y^5 - 48y^3$

Special Factoring Patterns

Sum of Two Cubes $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Difference of Two Cubes $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

CRummy CRummy SOPS Method for Sum & Difference

Answer key included

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FACTORING BY GROUPING & SUM/DIFFERENCE OF CUBES

FACTORING BY GROUPING & SUM/DIFFERENCE OF CUBES

Question	Answer
$x^3 - 2x^2 + 3x - 6$	
$4x^3 + 16x^2 - 3x - 12$	
$x^3 - 8$	
$5x^4 + 5x^3 + 6x^2 + 2x$	
$x^3 + 216$	
$125x^3 - 1$	
$6x^3 + 36x^2 + 2x + 12$	
$6x^3 + 48$	
$8x^3 - 27y^3$	
$27x^3 - 18x^2 - 12x + 8$	

Directions: Completely factor each polynomial. Write your answer in the box on exponent, if necessary. Do not use spaces in your answer.

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Self-Checking

Math with Ms. Rivera

FACTORING POLYNOMIALS

Color by Number Worksheet

FACTORING POLYNOMIALS

Color by Number Worksheet

Directions: Completely factor each polynomial. Circle the answer from the options. The numbers will determine how you color the grid page.

$x^2 - 7x^2 + 10x$	$2 \cdot 2x^3 - 54$
$x - 5)(x - 2)$ Red	$x(x + 5)(x + 2)$ Pink
$(x - 5)(x - 2)$ Orange	$(x - 3)(x^2 + 3x + 9)$ Black
	$4 \cdot 8x^5 - 16x^4 +$

Answer key included

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Math with Ms. Rivera

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!

The image shows a collage of algebra worksheets and a digital tablet. The worksheets include:

- Answer Key** for **ADDING & SUBTRACTING RATIONAL EXPRESSIONS** and **SOLVING SYSTEMS OF EQUATIONS**.
- MULTIPLYING & DIVIDING RATIONAL EXPRESSIONS** worksheet with problems like $\frac{x-2}{x^2+2x+1}$.
- SOLVING SYSTEMS OF EQUATIONS** worksheet with problems like $2. 2x - 6y = -18$ and $x = 3y - 4$.

The digital tablet displays a self-checking activity titled **Rational Expression Operations - Addition & Subtraction**. The directions are: "Answer each question and type the question number with the matching answer in the answer column to the right." The activity consists of a table with 8 questions and 8 answers, with a path of colored lines connecting the questions to their corresponding answers.

#	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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