

keep scrolling to
get a sneak peek!

Help your Algebra 2 students
practice **dividing polynomials**
using **synthetic division**.

Students will be eager to get
the self-checking benefits from
this circuit activity!

SYNTHETIC DIVISION

Differentiated Circuit Worksheet

SYNTHETIC DIVISION OF POLYNOMIALS CIRCUIT
A circuit is a route that starts and ends at the same place. Start in the first question, solve the problem. Search through the remaining boxes for the answer you got. Complete that question. Continue until you have completed the questions and returned to the original question. Record your path below.

1 → 9 → 6 → 8 → 3 → 5 → 7 → 4

Previous Answer: $2x^2 - 2x + 3 + \frac{-3}{x+3}$ # 10

1. Divide $(x^3 - 6x^2 + 11x - 6)$ by $(x - 2)$.

$$\begin{array}{r|rrrr} 2 & 1 & -6 & 11 & -6 \\ & \downarrow & 2 & -8 & 6 \\ \hline & & 1 & -4 & 3 & 0 \end{array}$$

$x^2 - 4x + 3$

Previous Answer: $x^2 + 4x + 3$ # 8

2. Divide $(2x^2 + 3x - 4)$ by $(x - 1)$.

$$\begin{array}{r|rr} 2 & 2 & 3 \\ & \downarrow & 2 \\ \hline & & 1 \end{array}$$

$2x + 5$



2 versions + answer key included

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Why do you need this?

Synthetic Division 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: _____

SYNTHETIC DIVISION OF 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: $2x^3 - 4x^2 + 11x - 26 + \frac{57}{x+2}$ # _____	Previous Answer: _____
1. Divide $(2x^3 - 3x^2 + 4x - 5)$ by $(x - 2)$.	2. Divide _____
Previous Answer: $x^2 - 4x + 3$ # _____	Previous Answer: _____
3. Divide $(3x^4 - 4x^3 + 7x^2 - x + 6)$ by $(x - 1)$.	4. Divide _____
Previous Answer: $3x^3 - x^2 + 6x + 5 + \frac{11}{x-1}$ # _____	Previous Answer: _____
5. Divide $(x^4 - x^3 + 2x^2 - 3x + 4)$ by $(x - 4)$.	6. Divide _____

Previous Answer: $x^2 - 4x + 10 + \frac{2}{x+10}$ # _____	Previous Answer: $x^2 - 10x + 1 + \frac{7}{x-3}$ # _____
7. Divide $(x^2 + 6x + 15)$ by $(x + 5)$.	8. Divide $(x^3 - 5x^2 - 33x - 27)$ by $(x - 9)$.
Previous Answer: $x^2 - 4x + 3$ # _____	Previous Answer: $2x + 7 + \frac{10}{x-2}$ # _____
9. Divide $(3x^3 + 11x^2 - 6x - 18)$ by $(x + 4)$.	10. Divide $(2x^3 + 4x^2 - 3x + 6)$ by _____

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

$$(ax^3 + bx^2 + cx + d) \div (x - n)$$

n	a	b	c	d
	↓	+		
		na		
			na	
				na

keep the p
original

Synthetic Division Circuit includes:

Challenge: Create a synthetic division problem with the following given requirements.

Requirements:

- The polynomial you are dividing must have 4 terms.
- The leading coefficient cannot be 1.
- There cannot be a remainder in your answer.
- Provide an answer key.

How are you feeling about this topic? Circle one:

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

$$(ax^3 + bx^2 + cx + d) \div (x - n)$$

n	a	b	c	d
	↓	+		
		na		
x	a	b + na		

keep the pattern going!

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

Synthetic Division Circuit

standards covered:

CCSS: HSA-APR.D.6

TEKs: A2.7.C

VA SOLs: A.2.a, All.1.a

SYNTHETIC DIVISION OF POLYNOMIALS CIRCUIT

Previous Answer: $x^3 + 3x^2 + 14x + 53 + \frac{216}{x-4}$ # 5

7. Divide $(x^5 + 7x^3 - x^2 + 8)$ by $(x + 1)$.

$$\begin{array}{r|rrrrrr} -1 & 1 & 0 & 7 & -1 & 0 & 8 \\ & \downarrow & -1 & 1 & -8 & 9 & -9 \\ \hline & 1 & -1 & 8 & -9 & 9 & -1 \end{array}$$
$$x^4 - x^3 + 8x^2 - 9x + 9 + \frac{-1}{x+1}$$

Previous Answer: $x^4 - 2x^3 + 2x^2 + 3x + 3 + \frac{-3}{x-2}$ # 6

8. Divide $(x^3 - 6x^2 + 11x - 6)$ by $(x - 2)$.

$$\begin{array}{r|rrrr} 2 & 1 & -6 & 11 & -6 \\ & \downarrow & 2 & -8 & 6 \\ \hline & 1 & -4 & 3 & 0 \end{array}$$
$$x^2 - 4x + 3$$

Previous Answer: $2x^2 + x + 6 + \frac{7}{x-2}$ # 1

9. Divide $(5x^3 - 6x^2 + x - 2)$ by $(x + 1)$.

$$\begin{array}{r|rrrr} -1 & 5 & -6 & 1 & -2 \\ & \downarrow & -5 & 11 & -12 \\ \hline & 5 & -11 & 12 & -14 \end{array}$$
$$5x^2 - 11x + 12 + \frac{-14}{x+1}$$

Previous Answer: $x^2 + 2x - 8 + \frac{25}{x+3}$ # 2

10. Divide $(2x^4 + 3x^2 - 4x + 5)$ by $(x + 2)$.

$$\begin{array}{r|rrrrr} -2 & 2 & 0 & 3 & -4 & 5 \\ & \downarrow & -4 & 8 & -22 & 52 \\ \hline & 2 & -4 & 11 & -26 & 57 \end{array}$$
$$2x^3 - 4x^2 + 11x - 26 + \frac{57}{x+2}$$

Challenge: Create a synthetic division problem with the following given requirements.

Requirements:

- The polynomial you are dividing must have 4 terms.
- The leading coefficient cannot be 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: _____

SYNTHETIC DIVISION OF 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 → _____ → _____ → _____ → _____ → _____ → _____ → _____ → _____ → _____ → 1

Previous Answer: $2x^3 - 4x^2 + 11x - 26 + \frac{57}{x+2}$ # _____	Previous Answer: $4x^2 - 6x + 7 + \frac{-6}{x+2}$ # _____
1. Divide $(2x^3 - 3x^2 + 4x - 5)$ by $(x - 2)$.	2. Divide $(x^3 + 5x^2 - 2x + 1)$ by $(x + 3)$.
Previous Answer: $x^2 - 4x + 3$ # _____	Previous Answer: $x^4 - x^3 + 8x^2 - 9x + 9 + \frac{-1}{x+1}$ # _____
3. Divide $(3x^4 - 4x^3 + 7x^2 - x + 6)$ by $(x - 1)$.	4. Divide $(4x^3 + 2x^2 - 5x + 8)$ by $(x + 2)$.

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 to dividing polynomials with synthetic division.

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

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

Name: **Answer Key** Date: _____

SYNTHETIC DIVISION OF 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 → **9** → **6** → **8** → **3** → **5** → **7** → **4** → **2** → **10** → 1

Previous Answer: $2x^3 - 4x^2 + 11x - 26 + \frac{57}{x+2}$ # 10	Previous Answer: $4x^2 - 6x + 7 + \frac{-6}{x+2}$ # 4
1. Divide $(2x^3 - 3x^2 + 4x - 5)$ by $(x - 2)$.	2. Divide $(x^3 + 5x^2 - 2x + 1)$ by $(x + 3)$.

Handwritten work for question 1:

$$\begin{array}{r|rrrrr} 2 & 2 & -3 & 4 & -5 & \\ & \downarrow & 4 & 2 & 12 & \\ \hline & 2 & 1 & 6 & 7 & \\ & & & & & 2x^2 + x + 6 \end{array}$$

Previous Answer: $x^2 - 4x + 3$

3. Divide $(3x^3 - 4x^2 + 7x - 1)$ by $(x + 3)$.

$$\begin{array}{r|rrrr} 3 & 3 & -4 & 7 & -1 & \\ & \downarrow & 9 & 1 & 6 & \\ \hline & 3 & -1 & 6 & 5 & \\ & & & & & 3x^3 - x^2 + 6x + 5 \end{array}$$

Previous Answer: $3x^3 - x^2 + 6x + 5$

5. Divide $(x^4 - x^3 + 2x^2 - 3x + 4)$ by $(x + 4)$.

$$\begin{array}{r|rrrrr} 4 & 1 & -1 & 2 & -3 & 4 & \\ & \downarrow & 4 & 12 & 56 & & \\ \hline & 1 & 3 & 14 & 53 & & \end{array}$$

SYNTHETIC DIVISION OF POLYNOMIALS CIRCUIT

Previous Answer: $x^3 + 3x^2 + 14x + 53 + \frac{216}{x-4}$ # 5	Previous Answer: $x^4 - 2x^3 + 2x^2 + 3x + 3 + \frac{-3}{x-3}$ # 6
7. Divide $(x^5 + 7x^3 - x^2 + 8)$ by $(x + 1)$.	8. Divide $(x^3 - 6x^2 + 11x - 6)$ by $(x - 2)$.

Handwritten work for question 7:

$$\begin{array}{r|rrrrrr} -1 & 1 & 0 & 7 & -1 & 0 & 8 & \\ & \downarrow & -1 & 1 & -8 & 9 & -9 & \\ \hline & 1 & -1 & 8 & -9 & 9 & -1 & \\ & & & & & & & x^4 - x^3 + 8x^2 - 9x + 9 + \frac{-1}{x+1} \end{array}$$

Handwritten work for question 8:

$$\begin{array}{r|rrrr} 2 & 1 & -6 & 11 & -6 & \\ & \downarrow & 2 & -8 & 6 & \\ \hline & 1 & -4 & 3 & 0 & \\ & & & & & x^2 - 4x + 3 \end{array}$$

Previous Answer: $2x^2 + x + 6 + \frac{7}{x-2}$ # 1	Previous Answer: $x^2 + 2x - 8 + \frac{25}{x+3}$ # 2
9. Divide $(5x^3 - 6x^2 + x - 2)$ by $(x + 1)$.	10. Divide $(2x^4 + 3x^2 - 4x + 5)$ by $(x + 2)$.

Handwritten work for question 9:

$$\begin{array}{r|rrrr} -1 & 5 & -6 & 1 & -2 & \\ & \downarrow & -5 & 11 & -12 & \\ \hline & 5 & -11 & 12 & -14 & \\ & & & & & 5x^2 - 11x + 12 + \frac{-14}{x+1} \end{array}$$

Handwritten work for question 10:

$$\begin{array}{r|rrrrr} -2 & 2 & 0 & 3 & -4 & 5 & \\ & \downarrow & -4 & 8 & -22 & 52 & \\ \hline & 2 & -4 & 11 & -26 & 57 & \\ & & & & & & 2x^3 - 4x^2 + 11x - 26 + \frac{57}{x+2} \end{array}$$

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You may also enjoy ...

SYNTHETIC DIVISION OF POLYNOMIALS

Printable Maze

Self-checking

Synthetic Division of Polynomials Maze

Directions: Find the quotient of each problem. The answer will lead you to the next question. Don't forget to show your work!

START HERE!

Name: _____

Directions: Find the quotient of each problem. The answer will lead you to the next question.

Math with Ms. Rivera

Answer key included

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DIVIDING POLYNOMIALS

Dividing Polynomials

Directions: View at 50% if puzzle goes off your screen. Type your answer into the "Answers" column. If you answer correctly, the box will turn green and part of the picture will be revealed. If you answer incorrectly, the box will turn red.

Questions	Answers
1 $8x^4 + 20x^3 + 16x^2 + 4x$	1
2 $(x^2 + 12x + 11) \div (x + 1)$	2
3 $(4x^2 - 19x + 21) \div (4x - 7)$	3
4 $-6x^5 + 18x^3 - 21x^2 + -3x^2$	4
5 $(30x^2 + 21x - 9) \div (10x - 3)$	5
6 $(7x^2 - 84x + 77) \div (x - 11)$	6
7 $(5x^2 - 38x - 120) \div (5x + 12)$	7
8 $(3x^2 + 24x - 60) \div (x + 10)$	8
9 $56x^7 - 80x^6 + 16x^5 - 24x^4 + 8x^3$	9
10 $(5x^2 + 28x + 15) \div (5x + 3)$	10

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Self-Checking

Math with Ms. Rivera

POLYNOMIAL FUNCTIONS

Algebra 2 Guided Notes

Graphical Function Characteristics

Complex Conjugates

CLASSIFYING POLYNOMIALS

Directions: Write a polynomial function $f(x)$ of leading coefficient 1, and zeros: 2 and $3 + i$.

Directions: Write a polynomial function $f(x)$ of leading coefficient 1, and zeros: $2 + 3i$ and $1 - i$.

Math with Ms. Rivera

Answer key included

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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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