

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.

Operations with Complex Numbers Circuit

Name: _____ Date: _____

OPERATIONS WITH COMPLEX NUMBERS 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: $11 - 13i$	# _____	Previous Answer: _____
1. Simplify. $(3 + 4i) + (2 - 5i)$		2. Simplify. _____
Previous Answer: $5 - i$	# _____	Previous Answer: _____
3. Simplify. $(-2 + 6i) + (1 - 8i)$		4. Simplify. _____
Previous Answer: $7 + 5i$	# _____	Previous Answer: _____
5. Simplify. $(2 + 3i)(1 - 4i)$		6. Simplify. _____
Previous Answer: $-5 + 12i$	# _____	Previous Answer: _____
7. Simplify. $(3 - i)(3 + i)$		8. Simplify. $(-2 + i)(2 - 3i)$
Previous Answer: $6 + 7i$	# _____	Previous Answer: $3 - 2i$
9. Simplify. $(1 + 2i)(1 - 2i)$		10. Simplify. $(2 + 3i)^2$

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

Complex Number: $a + bi$

real part imaginary number

Pattern of $i = \sqrt{-1}$

$i^2 = i \cdot i = -1$

Binomials: $(a + b)^2 = a^2 + 2ab + b^2$

Operations with Complex Numbers *includes:*

Challenge: Given the complex numbers, $(3 + 4i)$ and $(-1 + 2i)$, find the distance between the two points in the complex plane using the distance formula.

Given $(a + bi)$ & $(c + di)$

$$d = \sqrt{(a - c)^2 + (b - d)^2}$$

How are you feeling about this topic? Circle one:

© Malia Rivera, 2024

Complex Number: $a + bi$

real part imaginary number

Pattern of i
 $i = \sqrt{-1}$
 $i^2 = i \cdot i = \sqrt{-1} \cdot \sqrt{-1} = -1$

Multiplying two complex binomials: $(a + bi)(c + di)$

How are you feeling about this topic? Circle one:

© Malia Rivera, 2024

- ✓ 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

Operations with Complex Numbers Circuit

standards covered:

CCSS: HSN-CN.A.2

TEKs: A2.7.A

VA SOLs: EO.AII.2

OPERATIONS WITH COMPLEX NUMBERS CIRCUIT

Previous Answer: $3 + 4i$ # **10**

7. Simplify. $(3 - 2i)^2$

$$\begin{aligned} &(3 - 2i)(3 - 2i) \\ &(3)(3) + (3)(-2i) + (-2i)(3) + (-2i)(-2i) \\ &9 - 6i - 6i + 4i^2 \\ &9 - 12i - 4 \\ &\boxed{5 - 12i} \end{aligned}$$

Previous Answer: $-2 - 5i$ # **2**

8. Simplify. $(-2 + 5i)(-3 - i)$

$$\begin{aligned} &(-2)(-3) + (-2)(-i) + (5i)(-3) + (5i)(-i) \\ &6 + 2i - 15i - 5i^2 \\ &6 - 13i + 5 \\ &\boxed{11 - 13i} \end{aligned}$$

Previous Answer: $-10 + 23i$ # **6**

9. Simplify. $(1 + 2i)(3 - i)$

$$\begin{aligned} &(1)(3) + (1)(-i) + (2i)(3) + (2i)(-i) \\ &3 - i + 6i - 2i^2 \\ &3 + 5i + 2 \\ &\boxed{5 + 5i} \end{aligned}$$

Previous Answer: $14 - 5i$ # **5**

10. Simplify. $(2 + i)^2$

$$\begin{aligned} &(2 + i)(2 + i) \\ &(2)(2) + (2)(i) + (i)(2) + (i)(i) \\ &4 + 2i + 2i + i^2 \\ &4 + 4i - 1 \\ &\boxed{3 + 4i} \end{aligned}$$

Challenge: Given the complex numbers, $(3 + 4i)$ and $(-1 + 2i)$, find the distance between the two points in the complex plane using the distance formula.

Given $(a + bi)$ & $(c + di)$

$$d = \sqrt{(a - c)^2 + (b - d)^2}$$
$$d = \sqrt{(3 - (-1))^2 + (4 - 2)^2}$$
$$d = \sqrt{4^2 + 2^2}$$

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.

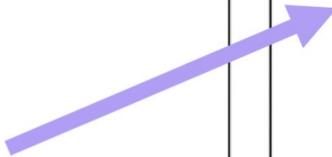
Name: _____ Date: _____

OPERATIONS WITH COMPLEX NUMBERS 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: $-1 + 8i$ # _____	Previous Answer: 10 # _____
1. Simplify. $(1 + 2i) + (3 - 4i)$	2. Simplify. $(5 + i) - (2 + 3i)$
Previous Answer: $4 - 2i$ # _____	Previous Answer: 5 # _____
3. Simplify. $(-1 + 6i) + (4 - 2i)$	4. Simplify. $(3 - 5i) - (1 - 2i)$



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 add, subtract, and multiply complex numbers.

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

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

Name: **Answer Key** _____ Date: _____

OPERATIONS WITH COMPLEX NUMBERS 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** → **9** → **4** → **5** → **10** → **7** → **2** → **8** → 1

Previous Answer: 11 - 13i # 8	Previous Answer: 5 - 12i # 7
1. Simplify. $(3 + 4i) + (2 - 5i)$	2. Simplify. $(5 - 3i) - (7 + 2i)$

$3 + 2 + 4i - 5i$
5 - i

OPERATIONS WITH COMPLEX NUMBERS CIRCUIT

Previous Answer: 3 + 4i # 10	Previous Answer: -2 - 5i # 2
7. Simplify. $(3 - 2i)^2$ $(3 - 2i)(3 - 2i)$ $(3)(3) + (3)(-2i) + (-2i)(3) + (-2i)(-2i)$ $9 - 6i - 6i + 4i^2$ $9 - 12i - 4$ 5 - 12i	8. Simplify. $(-2 + 5i)(-3 - i)$ $(-2)(-3) + (-2)(-i) + (5i)(-3) + (5i)(-i)$ $6 + 2i - 15i - 5i^2$ $6 - 13i + 5$ 11 - 13i
Previous Answer: -10 + 23i # 6	Previous Answer: 14 - 5i # 5
9. Simplify. $(1 + 2i)(3 - i)$ $(1)(3) + (1)(-i) + (2i)(3) + (2i)(-i)$ $3 - i + 6i - 2i^2$ $3 + 5i + 2$ 5 + 5i	10. Simplify. $(2 + i)^2$ $(2 + i)(2 + i)$ $(2)(2) + (2)(i) + (i)(2) + (i)(i)$ $4 + 2i + 2i + i^2$ $4 + 4i - 1$ 3 + 4i

Previous Answer: 5 - i
3. Simplify. $(-2 + 6i) + (1 - 8i)$ $-2 + 1 + 6i - 8i$ -1 - 2i
Previous Answer: 7 + 5i
5. Simplify. $(2 + 3i)(1 - 4i)$ $(2)(1) + (2)(-4i) + (3i)(1) + (3i)(-4i)$ $2 - 8i + 3i - 12i^2$ $2 - 5i + 12$ 14 - 5i

Challenge: Given the complex numbers $(3 + 11i)$ and $(1 + 2i)$, find the distance between the two

You may also enjoy ...

COMPLEX NUMBERS

Algebra 2 Guided Notes

COMPLEX CONJUGATION
Complex Conjugate Pairs
Complex numbers that have the same real parts (a) and opposite imaginary parts (b). Conjugates always come in pairs.
Write the conjugate of each complex number.
5i + 7 -2 + i

OPERATIONS OF COMPLEX NUMBERS
Sum & Difference of Complex Numbers
Add or subtract the real parts and their imaginary parts.
Sum of Complex Numbers: $(a+bi)+(c+di)=(a+c)+(b+d)i$
Difference of Complex Numbers: $(a+bi)-(c+di)=(a-c)+(b-d)i$
Directions: Add or subtract each expression. Write your answer in standard form.
 $(8-i) + (5+4i) = 13+3i$
 $(7-6i) - (3-6i) = 4$

with Ms. Rivera
Answer key included
© Malia Rivera, 2023

OPERATIONS OF COMPLEX NUMBERS

Question	Answer
$(5 + 8i) + (-6 + 10i)$	
$(2 - 3i) - (1 - 4i)$	
$6i(3 + 7i)$	
$(19 - 9i) - (12 + 5i)$	
$(-2 + 6i)(-2 - 7i)$	
$(1 - 3i) + (2 - 7i)$	
$(4 - i)(4 + i)$	
$(1 - i)(-2 + 3i)$	
$(8 - i)^2$	
$(6 + 3i)(2 + 4i)$	

Directions: Do not use spaces in your answer.
© Malia Rivera, 2024

with Ms. Rivera
Self-Checking

OPERATIONS OF COMPLEX NUMBERS

Printable Maze

Self-Checking Operations of Complex Numbers Maze
Directions: Simplify each complex expression. The answer will lead you to the next question. Don't forget to show your work!

START HERE!
 $4i(-2 - 8i)$
 $-5 - 9i$
 $-1 - 8i - 4 - i$
 $-5 - 7i$
 $32 - 8i$
 $-1 + 9i$
 $4i(-2 - 8i)$
 $(7 + 6i)(-8 + 3i)$
 $-1 - 8i - 4 - i$
START HERE!

with Ms. Rivera
Answer key included
© Malia Rivera, 2023

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
ADDING & SUBTRACTING RATIONAL EXPRESSIONS
 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