Class:	**ALGEBRA 2**			
Teacher:	DAILY	HERN	LUNETTA	PEREIRA
Period:	1, 2	1	3, 5, 6	3, 4
Assignment:	**WEEK 1**			

WEEK	ASSIGNMENT	DATE
1	I can add complex numbers. (Practice, do as many as you wish. Answers provided.)	4/20
	Are You Ready? I can add complex numbers. (Required, complete after you have practiced.)	
	I can subtract complex numbers. (Practice, do as many as you wish. Answers provided.)	4/21
	Are You Ready? I can subtract complex numbers. (Required, complete after you have practiced.)	
	I can multiply complex numbers. (Practice, do as many as you wish. Answers provided.)	4/22
	Are You Ready? I can multiply complex numbers. (Required, complete after you have practiced.)	
	I can simplify complex expressions. (Practice, do as many as you wish. Answers provided.)	4/23
	Are You Ready? I can simplify complex expressions. (Required, complete after you have practiced.)	
	N-CN.2 Standard Assessment (Required, complete after you are ready.)	4/24

INSTRUCTION

I can add complex numbers

An example of a complex number is $\boldsymbol{3-4i}$. Complex numbers have the form $\boldsymbol{a+bi}$, where $\boldsymbol{a}$ is called the real part and $\boldsymbol{b}$ is the imaginary part.

Think about adding like terms from Algebra 1. In the problem $(3x+4)+(x+5)$ you would see the $3x$ and x are like, and the 4 and 5 are like. When you simplify you would get $(3x+x)$ and $(4+5)$ for a final answer of $5x+9$.

Simplifying the addition of two complex numbers would work the same way:

$$(2+5i)+(6+i) = (2+6)+(5i+i) = 8+6i$$

I can subtract complex numbers

Subtracting works just the same as adding, except you must pay close attention to the subtraction sign. Forgetting that subtraction sign will be your rookie mistake.

$$(2+5i)-(6+i) = (2-6)+(5i-i) = -4+4i$$

Notice that as you are gathering the like terms from each complex number you take a copy of that subtraction sign with you. Don't forget that subtracting a negative is the same as addition, as in this problem:

$$(1+i)-(3-4i) = (1-3)+(i-(-4i)) = -2+5i$$

I can multiply complex numbers

Being organized is key when multiplying complex numbers, so use the box method and you will be less likely to make a mistake.

$(6-i)(2+3i) =$

	2	$3i$
6	12	$18i$
$-i$	$-2i$	$-3i^2$

$= 12+16i-3i^2$

We have some more work to do when simplifying the i^2, but that will be in the next lesson.

I can simplify complex expressions

What **is** i, anyway? It is defined as the square root of -1, like this: $i=\sqrt{-1}$. No wonder we call it an imaginary number!

If i is the square root of -1, then i^2 must be $i\cdot i$, which is $\sqrt{-1}\cdot\sqrt{-1}$. But that's just -1! So, $i^2=-1$.

There are two things to watch out for when simplifying a complex expression: 1) i is not allowed to remain in the denominator of a fraction, and 2) $i^2=-1$. To fix an i in the denominator you must "rationalize the denominator". That's a fancy way of saying you must multiply by 1. Here's an example.

$$\frac{3+2i}{2-4i} = \frac{3+2i}{2-4i}\cdot\frac{2+4i}{2+4i} = \frac{6+16i+8i^2}{4-0i-16i^2} = \frac{6+16i-8}{4+16} = \frac{-2+16i}{20} = \frac{-1+8i}{10}$$

In step2, notice how the 1 is written as a fraction where the numerator and denominator are the same as the original denominator but with the middle sign switched? That's called the conjugate. The conjugate of $2-4i$ is $2+4i$. The conjugate of $3+i$ would be $3-i$. Get to step 3 by using the box method (twice!). In step 4 the i^2 changes the sign of its coefficient. Do you see why?

$$8i^2 = 8\cdot i^2 = 8\cdot -1 = -8$$

For step 5 combine like terms. In the last step the -2, 16, and 20 can be reduced since they are all even.

I can add complex numbers

Name_____ ID: 1

Date_____ Period____

Simplify.

1) $(-1 + 7i) + (5 + 4i)$

2) $(-2 - 5i) + (3 - 5i)$

3) $(1 + 3i) + (-6 - 3i)$

4) $(-6 + 7i) + (5 + 6i)$

5) $(-6 - i) + (1 - 5i)$

6) $(-4i) + (4i) + (5 + 6i)$

7) $(-6 + 2i) + (-5 - 6i)$

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

9) $(7 + i) + (-7 + 6i)$

10) $(-7 + 7i) + (7i) + 8$

11) $(-7 - 2i) + (1 - 8i)$

12) $(3 - 2i) + (1 - 4i)$

13) $-8 + 2 + (7 - 5i)$

14) $(3 + 3i) + (1 - 8i)$

15) $(-7 + 5i) + (-4 + 5i)$

16) $-5 + (-2 + 4i) + (4i)$

17) $(-3 - 2i) + (4 - 3i)$

18) $(-8 + i) + (5 + 5i)$

19) $(i) + (4 - 4i) + (i)$

20) $(-5 + 8i) + (5 - 6i)$

1) $4 + 11i$
2) $1 - 10i$
3) -5
4) $-1 + 13i$
5) $-5 - 6i$
6) $5 + 6i$
7) $-11 - 4i$
8) $3 - 2i$
9) $7i$
10) $1 + 14i$
11) $-6 - 10i$
12) $4 - 6i$
13) $1 - 5i$
14) $4 - 5i$
15) $-11 + 10i$
16) $-7 + 8i$
17) $1 - 5i$
18) $-3 + 6i$
19) $4 - 2i$
20) $2i$

I can subtract complex numbers

Name_____ ID: 1

Date_____ Period____

Simplify.

1) $(-4 - 7i) - (-4 + 3i)$

2) $(-2 + i) - (-3 - i)$

3) $(-1 - i) - (-3 - 8i)$

4) $(4 + 4i) - (-7 - 7i)$

5) $(3 - i) - (8 + 3i)$

6) $(8i) + (i) - (-6 - 3i)$

7) $(1 - 4i) - (3i) + 6$

8) $(2 + 4i) - (-7 + 2i)$

9) $(-5 + 6i) - 4 - 5$

10) $(3 - 7i) - (7 + 7i)$

11) $(-3 + 3i) - (-6 + 7i)$

12) $(3 - 4i) - (7 + 7i)$

13) $-6 - (-1 - 2i) - 7$

14) $7 - (6 - 6i) - (7i)$

15) $(-6 - 5i) + (7 + i)$

16) $(-7 - 6i) - (8 - 4i)$

17) $(5 + 5i) - (-7 - i)$

18) $(7 - 5i) - (2i) - (7i)$

19) $(-6 - 7i) - (5 + 2i)$

20) $-7 - (6i) - (3 - 3i)$

1) $-10i$
2) $1 + 2i$
3) $2 + 7i$
4) $11 + 11i$
5) $-5 - 4i$
6) $6 + 12i$
7) $7 - 7i$
8) $9 + 2i$
9) $-14 + 6i$
10) $-4 - 14i$
11) $3 - 4i$
12) $-4 - 11i$
13) $-12 + 2i$
14) $1 - i$
15) $1 - 4i$
16) $-15 - 2i$
17) $12 + 6i$
18) $7 - 14i$
19) $-11 - 9i$
20) $-10 - 3i$

I can multiply complex numbers

Name_____ ID: 1

Date_____ Period____

Simplify.

1) $(-5 - 8i)(1 + 7i)$

2) $(-3 - 4i)(4 + 2i)$

3) $(6 + 8i)^2$

4) $(-6i)(-7i)(-4 - 2i)$

5) $(i)(3i)(-1 - 7i)$

6) $(-2 + 3i)(-7 - 5i)$

7) $(-1 + 6i)^2$

8) $(-7 - 3i)(8 + 6i)$

9) $(7 + 2i)(4 + 2i)$

10) $4(2i)(-4 - 7i)$

11) $(6 - 5i)^2$

12) $(6 - 3i)(2 + 7i)$

13) $(3 - 2i)(6 - 8i)$

14) $(-8i)(-2i)(-5 + 8i)$

15) $(-5 + 6i)^2$

16) $(i)(i)(3 + 6i)$

17) $8(-3i)(-2 + 6i)$

18) $(-1 + 5i)(-3 - 5i)$

19) $(5i)(3i)(-8 - 7i)$

20) $(-6 + 4i)(6 + i)$

1) $-10i$
2) $1 + 2i$
3) $2 + 7i$
4) $11 + 11i$
5) $-5 - 4i$
6) $6 + 12i$
7) $7 - 7i$
8) $9 + 2i$
9) $-14 + 6i$
10) $-4 - 14i$
11) $3 - 4i$
12) $-4 - 11i$
13) $-12 + 2i$
14) $1 - i$
15) $1 - 4i$
16) $-15 - 2i$
17) $12 + 6i$
18) $7 - 14i$
19) $-11 - 9i$
20) $-10 - 3i$

I can simplify complex expressions Name_____ ID: 1

Date_____ Period____

Simplify.

1) $\frac{9}{-8i}$

2) $\frac{-7+4i}{-10i}$

3) $\frac{-9-4i}{4i}$

4) $\frac{-3+3i}{10i}$

5) $\frac{9}{-9i}$

6) $\frac{10}{-5i}$

7) $\frac{10+3i}{i}$

8) $(5-6i)(8-8i)$

9) $(7+6i)^2$

10) $(-2-7i)^2$

11) $(5+8i)(-5+5i)$

12) $(8-8i)(1+4i)$

13) $-3(2i)(-1+6i)$

14) $\frac{7-6i}{6+2i}$

15) $\frac{1-4i}{9-5i}$

16) $\frac{-10+i}{-9-4i}$

17) $\frac{7i}{-9-i}$

18) $\frac{-4-5i}{1-6i}$

19) $\frac{2-10i}{6-8i}$

20) $\frac{6i}{8+3i}$

1) $\frac{9i}{8}$
2) $\frac{-7i-4}{10}$
3) $\frac{9i-4}{4}$
4) $\frac{3i+3}{10}$
5) i
6) $2i$
7) $-10i+3$
8) $-8-88i$
9) $13+84i$
10) $-45+28i$
11) $-65-15i$
12) $40+24i$
13) $36+6i$
14) $\frac{3-5i}{4}$
15) $\frac{29-31i}{106}$
16) $\frac{86-49i}{97}$
17) $\frac{-63i-7}{82}$
18) $\frac{26-29i}{37}$
19) $\frac{23-11i}{25}$
20) $\frac{48i+18}{73}$

Student _____
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Class ALGEBRA 2 Period _____

*** REMOVE FROM PACKET, TURN IN ***
***Attach additional binder paper as needed. ***
***Make sure it is clearly labeled. ***

Are You Ready? I can add complex numbers.

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

2 Simplify. $(-7-5i)+(-3+5i)$

3 Simplify. $(4-8i)+(1+5i)$

4 Simplify. $(-1+4i)+(-1-2i)$

5 Simplify. $(-4-5i)+(-7-8i)$

6 Simplify. $(6+2i)+(-6+5i)$

Are You Ready? I can subtract complex numbers.

1 Simplify. $(5+6i)-(-8-5i)$

2 Simplify. $(5+5i)-(7-6i)$

3 Simplify. $(4-4i)-(3+5i)$

4 Simplify. $(7+5i)-(-3-3i)$

5 Simplify. $(7-5i)-(-7-7i)$

6 Simplify. $(-5+i)-(1+4i)$

Are You Ready? I can multiply complex numbers.

1 Simplify. $(6+5i)(2-3i)$

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

3 Simplify. $(5+6i)(7+2i)$

4 Simplify. $(2-8i)(8+4i)$

5 Simplify. $(8-4i)(1-3i)$

6 Simplify. $(1-6i)(4+5i)$

Are You Ready? I can simplify complex expressions.

1 Simplify. $\dfrac{-8}{-10i}$

2 Simplify. $\dfrac{-9+7i}{-2i}$

3 Simplify. $\dfrac{8}{-5+i}$

4 Simplify. $\dfrac{8+10i}{1+5i}$

5 Simplify. $(-4+7i)^2$

6 Simplify. $(3-5i)(8-8i)$

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Algebra 2 U2

N-CN.2 Standard Assessment

1 Simplify. $(-6+4i)+(-4+i)$

2 Explain your reasoning for Question 1.

3 Simplify. $(-3-8i)-(-8+6i)$

4 Explain your reasoning for Question 3.

5 Simplify. $(-8-2i)(4-4i)$

6 Explain your reasoning for Question 5.

7 Simplify. $(3+i)(1-7i)$

8 Explain your reasoning for Question 7.

9 Simplify. $\dfrac{-10+9i}{-9i}$

10 Explain your reasoning for Question 9.

11 Simplify. $\dfrac{4i}{-1-9i}$

12 Explain your reasoning for Question 11.