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Date \_\_\_\_\_  
Algebra II

## Operations with Complex Numbers

Multiply the following pairs of complex numbers and express in a + bi form

1.  $(-2 + 9i) + (6 + 8i)$   
 $-2 + 9i + 6 + 8i$   
 $4 + 17i$

2.  $(-10 + 2i) + (7 + 6i)$   
 $-10 + 2i + 7 + 6i$   
 $-3 + 8i$

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

4.  $(-2 + 2i) - (8 - i)$   
 $-2 + 2i - 8 + i$   
 $-10 + 3i$

5.  $(7 - 2i) \cdot (8 + 3i)$

7	-2i
8	56
-2i	-6i
3i	21
	6i

$56 + 5i - 6i^2$   
 $56 + 5i - 6(-1)$   
 $56 + 5i + 6$   
 $62 + 5i$

6.  $(6 - i) \cdot (8 - 5i)$

6	-i
8	48
-i	-8i
-5i	-30i
	5i^2

$48 - 38i + 5i^2$   
 $48 - 38i + 5(-1)$   
 $48 - 38i - 5$   
 $43 - 38i$

7.  $(5 - 2i) \cdot (2 - 3i)$

5	-2i
2	10
-2i	-4i
-3i	-15i
	6i^2

$10 - 19i + 6i^2$   
 $10 - 19i + 6(-1)$   
 $10 - 19i - 6$   
 $4 - 19i$

8.  $(-2 + 2i) \cdot (8 - i)$

-2	2i
8	-16
2i	16i
-i	-2i
	-2i^2

$-16 + 18i - 2i^2$   
 $-16 + 18i - 2(-1)$   
 $-16 + 18i + 2$   
 $-14 + 18i$

9.  $(-2 + 9i) \cdot (6 + 8i)$

-2	9i
6	-12
9i	81i
8i	-18i
	72i^2

$-12 + 38i + 72i^2$   
 $-12 + 38i + 72(-1)$   
 $-12 + 38i - 72$   
 $-84 + 38i$

10.  $(-7 + 2i) \cdot (7 + 6i)$

-7	2i
7	-49
2i	14i
6i	-42i
	12i^2

$-49 - 28i + 12i^2$   
 $-49 - 28i + 12(-1)$   
 $-49 - 28i - 12$   
 $-61 - 28i$

11.  $(2-yi)^2$   
 $(2-yi)(2-yi)$

2	$-yi$
4	$-2yi$
$-2yi$	$y^2$

$4 - 4yi + y^2$   
 $4 - 4yi + y^2(-1)$   
 $4 - 4yi - y^2$

13.  $(3k-2i)^2$

$3k$	$-2i$
$9k^2$	$-6ki$
$-6ki$	$4i^2$

$9k^2 - 12ki + 4i^2$   
 $9k^2 - 12ki + 4(-1)$   
 $9k^2 - 12ki - 4$

15.  $3xi(3-2i)$

$9xi - 6xi^2$   
 $9xi - 6x(-1)$   
 $10xi + 6x$

17.  $2xi(i-4i^2)$

$2xi^2 - 8xi^3$   
 $2x(-1) - 8x(-i)$   
 $-2x + 8xi$

19.  $2i(\sqrt{-4}-4)$

$2i(2i-4)$   
 $4i^2 - 8i$   
 $4(-1) - 8i$   
 $-4 - 8i$

$\sqrt{-4}$   
 $i\sqrt{4}$   
 $2i$

12.  $(3-7i)^2$   
 $(3-7i)(3-7i)$

3	$-7i$
9	$-21i$
$-21i$	$49i^2$

$9 - 42i + 49i^2$   
 $9 - 42i + 49(-1)$   
 $9 - 42i - 49$   
 $-40 - 42i$

14.  $(4x-3yi)^2$

$(4x-3yi)(4x-3yi)$

$4x$	$-3yi$
$16x^2$	$-12xyi$
$-12xyi$	$9y^2i^2$

$16x^2 - 24xyi + 9y^2i^2$   
 $16x^2 - 24xyi + 9y^2(-1)$   
 $16x^2 - 24xyi - 9y^2$

16.  $5i+4i(2+3i)$

$5i + 8i + 12i^2$   
 $13i + 12(-1)$   
 $-12 + 13i$

18.  $6xi^3(-4xi+5)$

$6x(-i^3)(-4xi+5)$   
 $-6xi^3(-4xi+5)$   
 $24xi^3i^2 - 30xi^3$   
 $24x^2(-1) - 30xi^3$

$-24x^2 - 30xi^3$

20.  $-\frac{1}{2}i^3(\sqrt{-9}-4)-3i^2$

$-\frac{1}{2}(-i)(3i-4)-3(-1)$

$\frac{1}{2}i(3i-4)+3$

$\frac{3}{2}i^2 - 2i + 3$

$\frac{3}{2}(-1) - 2i + 3$

$-\frac{3}{2} - 2i + 3$   
 $\frac{3}{2} - 2i$

$\sqrt{-9}$   
 $i\sqrt{9}$   
 $3i$