Integrated Math 3 Name KEY

4.6 (Day 1) Homework Operations within the Complex Number System

1. What is the difference between a real and an imaginary number?

An imaginary number exists when you take the square root of a negative number. Real numbers can be found on the number line while imaginary numbers cannot. Both types of numbers are Complex.

2. What is the difference between a complex number and an imaginary number?

A complex number can be real or imaginary as it is the all encompassing set. Imaginary numbers are always Complex.

For the following numbers, state ALL the sets that it belongs to.

3. -15 → Integers, Rational, Real, Complex.

4. π → Irrational, Real, Complex.

5. -2 + 4i → Imaginary, Complex.

6. 1 → Natural, Whole, Integers, Rational, Real, Complex.

Perform the following operations. Be sure to write your final answer in Standard Form: a + bi.

7. (-i) + (6i)

$5i$

8. (-4i) – (5i)

$-9i$

9. (-6 – 2i) + (6 – 5i)

$-6-2i+6-5i$

$-7i$

10. (5 – 3i) – (-2 – 5i)

$5-3i+2+5i$

$7+2i$

11. (-7 + 7i) – (-7 – 3i) + (-7 – 8i)

$-7+7i+7+3i-7-8i$

$-7+2i$

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12. $(3 + 8i)(-2 - i)$

$-6 - 3i - 16i - 8i^2$

$-6 - 19i - 8(-1)$

$-6 - 19i + 8$

$2 - 19i$

13. $(8 + 7i)^2$

$(8+7i)(8+7i)$

$64 + 56i + 56i + 49i^2$

$64 + 112i + 49(-1)$

$64 + 112i - 49$

$15 + 112i$

14. $(4 - 3i)(6 - 6i)$

$24 - 24i - 18i + 18i^2$

$24 - 42i + 18(-1)$

$6 - 42i$

15. $(i)(i)(i)(i)(i)(i)(i)(i)$

$1 \cdot 1 \cdot 1 \cdot 1$

1

16. $(8 + 5i)(6 + 2i)$

$48 + 16i + 30i + 10i^2$

$48 + 46i + 10(-1)$

$38 + 46i$

17. $3(7 - 2i)$

$21 - 6i$