*AAT

Name: Key

Chapter 2: 2-4 Complex Numbers (IC/HW)-Day 1

Date: _____ Period: _____

Write the expression in the form a + bi, where *a* and *b* are real numbers.

1. $(7 - 6i) - (-11 - 3i)$

$7 - 6i + 11 + 3i$

$18 - 3i$

2. $(-2 + 6i)(8 - i)$

$-16 + 50i - 6i^2$

$-10 + 50i$

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

$(5-2i)(5-2i)$

$25 - 20i + 4i^2$

$21 - 20i$

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

$9 - 16i^2$

25

5. i^{43}

$-i$

6. i^{66}

-1

7. i^{92}

1

8. $\frac{(1-7i)(6+2i)}{(6-2i)(6+2i)}$

$\frac{6 - 40i - 14i^2}{36 - 4i^2} = \frac{20 - 40i}{40}$

$= \frac{1}{2} - i$

9. $\frac{-3-2i}{5+2i}\ \frac{(5-2i)}{(5-2i)}$

$\frac{-15 - 4i + 4i^2}{25 - 4i^2} = \frac{-19 - 4i}{29}$

10. $(2 + 3i)^3$

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

$(4 + 12i + 9i^2)(2 + 3i)$

$(-5 + 12i)(2 + 3i)$

$-10 + 9i + 36i^2$

$-46 + 9i$

11. $(-3 + \sqrt{-25})(8 - \sqrt{-36})$

$(-3 + 5i)(8 - 6i)$

$-24 + 58i - 30i^2$

$6 + 58i$

12. $(2 - \sqrt{-4})(3 - \sqrt{-16})$

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

$6 - 14i + 8i^2$

$-2 - 14i$

Find the values of x and y, where x and y are real numbers.

13. $4 + (x + 2y)i = x + 2i$

$4 = x$

$x + 2y = 2$

$4 + 2y = 2$

$2y = -2$

$y = -1$

14. $(x - y) + 3i = 7 + yi$

$3 = y$

$x - y = 7$

$x - 3 = 7$

$x = 10$

15. $(2x - y) - 16i = 10 + 4yi$

$2x - y = 10$

$\frac{-16}{4} = \frac{4y}{4}$

$-4 = y$

$2x - (-4) = 10$

$2x = 6$

$x = 3$

Find the solutions of the equation.

16. $x^2 - 6x + 13 = 0$

$x^2 - 6x + 9 = -13 + 9$

$\sqrt{(x-3)^2} = \sqrt{-4}$

$x - 3 = \pm 2i$

$x = 3 \pm 2i$

17. $x^2 + 4x + 13 = 0$

$x^2 + 4x + 4 = -13 + 4$

$\sqrt{(x+2)^2} = \sqrt{-9}$

$x + 2 = \pm 3i$

$x = -2 \pm 3i$

18. $x^2 + 3x + 6 = 0$

$x^2 + 3x + \frac{9}{4} = -6 + \frac{9}{4}$

$\sqrt{\left(x + \frac{3}{2}\right)^2} = \sqrt{\frac{-15}{4}}$

$x + \frac{3}{2} = \pm \frac{i\sqrt{15}}{2}$

$x = -\frac{3}{2} \pm \frac{i\sqrt{15}}{2}$