Student: Cole Lamers **Date:** 06/09/19	**Instructor:** Kelly Galarneau **Course:** CA&T Internet (70263) Galarneau	**Assignment:** 1.3 Complex Numbers and Quadratic Equations

1. Complete the following sentence.

   For $b > 0$, $\sqrt{-b}$ = _____.

   For $b > 0$, $\sqrt{-b}$ = $i\sqrt{b}$.
   (Type an exact answer, using radicals as needed.)

2. Watch the video and then solve the problem given below.

   Click here to watch the video.[1]

   Write $\left(-2+\sqrt{-16}\right)-\left(5-\sqrt{-81}\right)$ in standard form.

   $\left(-2+\sqrt{-16}\right)-\left(5-\sqrt{-81}\right)$ = $-7+13i$ (Simplify your answer.)

   1: http://mediaplayer.pearsoncmg.com/assets/xLnVlBXbJbsPMuRBaCjf89KjE_hrtiv5

3. Add or subtract and simplify.

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

   $(4+4i)+(9-i)$ = $13+3i$
   (Simplify your answer. Type your answer in the form a + bi.)

4. Subtract and simplify.

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

   $(6-i)-(7+3i)$ = $-1-4i$
   (Simplify your answer. Type your answer in the form a + b i .)

5. Multiply.

   $4(5-4i)$

   $4(5-4i)$ = $20-16i$
   (Type your answer in the form a+bi.)

6. Multiply.

   $4i(3-5i)$

   $4i(3-5i)$ = $12i+20$
   (Simplify your answer. Type your answer in the form a + b i .)

7. Watch the video and then solve the problem given below.

Click here to watch the video.[2]

Write $(6 - 5i)(2 + 3i)$ in standard form.

$(6 - 5i)(2 + 3i) =$ $8i + 27$ (Simplify your answer.)

2: http://mediaplayer.pearsoncmg.com/assets/3vKiaBG_gqCqjlpjbSVTuzRJwctfGoxQ

8. Multiply.

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

$(5 + 6i)(2 + i) =$ $4 + 17i$
(Simplify your answer. Type your answer in the form $a + bi$.)

9. Multiply.

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

$(8 + 7i)(8 - 7i) =$ 113
(Type your answer in the form $a + bi$.)

10. Find the conjugate $\bar{z}$ of the complex number z. Then find $z\bar{z}$.

$z = 6 + 2i$

What is the complex conjugate?

$\bar{z} =$ $6 - 2i$
(Simplify your answer. Express complex numbers in terms of i.)

What is the product?

$z\bar{z} =$ 40
(Simplify your answer. Express complex numbers in terms of i.)

11. Write in standard form.

$\frac{6}{i}$

$\frac{6}{i} =$ $-6i$
(Simplify your answer. Type your answer in the form $a + bi$.)

12. Divide.

$\frac{8}{5 + i}$

$\frac{8}{5 + i} =$ $\frac{20}{13} - \frac{4}{13}i$
(Simplify your answer. Type an integer or a fraction. Type your answer in the form $a + bi$.)

13. Watch the video and then solve the problem given below.

Click here to watch the video.[3]

Solve $x^2 - 4x = -13$.

The solution set is $\{ 2+3i, 2-3i \}$.
(Simplify your answer. Type an exact answer, using radicals and i as needed. Use a comma to separate answers as needed.)

3: http://mediaplayer.pearsoncmg.com/assets/acxlwJY4djmYDcQHqujgHy1A7CZuOPYN

14. Solve for x using the quadratic formula.

$x^2 - 6x + 18 = 0$

The solution set is $\{ 3+3i, 3-3i \}$.
(Type an exact answer, using radicals as needed. Express complex numbers in terms of i . Use a comma to separate answers as needed.)

15. Solve the equation.

$4(x^2 - x) = x^2 - 3$

The solution set is $\left\{ \frac{2}{3} + \frac{\sqrt{5}}{3}i, \frac{2}{3} - \frac{\sqrt{5}}{3}i \right\}$.
(Simplify your answer. Type an exact answer, using radicals as needed. Type your answer in the form a + bi. Use a comma to separate answers as needed.)

16. Use the equation V = ZI to find the value that is not specified.

Finding voltage: Z = 7 − 6i I = 4 + 6i

V = $64 + 18i$ (Simplify your answer. Type your answer in the form a + bi.)

17. The impedance Z, voltage V, and current I in a circuit can be represented by complex numbers and are related by the equation shown below. If two of these values are given, the value of the third can be found from this equation. Find the value that is not specified.

$Z = \frac{V}{I}$ V = 12 + 27i Z = 12 + 6i

I = $\frac{17}{10} + \frac{7}{5}i$
(Type your answer in the form a + bi. Use integers or fractions for any numbers in the expression.)

18. Simplify.

i^{33}

i^{33} = i
(Simplify your answer. Type your answer in the form a + bi.)

19. Find the power of i and simplify the expression.

i^{-47}

i^{-47} = i

(Simplify your answer. Type your answer in the form a + b*i*.)

20. Find the power of i and simplify the expression.

$i^{22} + 8$

$i^{22} + 8$ = 7

(Simplify your answer.)