HSN-CN.A.1
(Chapter 3.2, IXL H1, J4) – 5 questions
- Know there is a complex number $i$ such that $i^2 = -1$, and every complex number has the form $a + bi$ with $a$ and $b$ real.

1) Use imaginary number $i$ to re-write the expression below as a complex number. Simplify all radicals. (IXL H1)

$$-\sqrt{-16}$$

2) Use imaginary number $i$ to re-write the expression below as a complex number. Simplify all radicals. (IXL H1)

$$\sqrt{-8}$$

3) Use imaginary number $i$ to re-write the expression below as a complex number. Simplify all radicals. (IXL H1)

$$-15 + \sqrt{-68}$$
4) Find the complex conjugate of the number. Write your answer in a + bi format. (IXL H1)

\[-7 + 8i\]

5) Solve for the given variable. Write your answer in simplified, rationalized form. (IXL J4)

\[-9v^2 - 81 = 0\]


**HSN-CN.A.2**

(Chapter 3.2, IXL H2-H6) – 5 questions

- Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.

6) Add/subtract: Simplify and write your answers in the form $a + bi$ (H2-H3)
   
   a) $5i + 6i$
   
   b) $-(17 - 8i) + (-15i + 18)$
   
   c) $-1 - 4i$

7) Complex Conjugate: Simplify and write your answers in the form $a + bi$ (H3)

   Find the sum of $-6 + 2i$ and its complex conjugate.

8) Multiply: Simplify and write your answers in the form $a + bi$ (H4)

   a) $(-6i)^2$
   
   b) $-5i\sqrt{5} \cdot 5\sqrt{5}$
   
   c) $(7 + i)(7 - i)$
9) Divide: Simplify and write your answers in the form $a + bi$ (H5)

\[
\frac{-2i}{i}
\]

10) One complex problem: Simplify and write your answers in the form $a + bi$ (H6)

\[
\frac{4}{3 + 5i}
\]

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**ANSWER KEY**

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Name:______________________________________  Period:________________
**HSF-IF.C.8a**  
(Chapter 3.1 and 3.3, J5, J7 and J8)  
- Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

**HSN-CN.C.7**  
(Chapter 3.2 and 3.3 and 3.4, IXL J7 and J8)  
- Solve quadratic equations with real coefficients that have complex solutions.

11) Find zeros: Solve for the given variable. Write your answers as integers or as proper or improper fractions in simplest form. (J5)

\[(d - 9)(d + 4) = 0\]

12) Find zeros: Solve for the given variable. Write your answers as integers or as proper or improper fractions in simplest form. (J5)

\[(2s + 7)(8s + 9) = 0\]

13) Find zeros: Solve for the given variable. Write your answers as integers or as proper or improper fractions in simplest form. (J5)

\[-7y(y + 3) = 0\]
14) Complete the Square when $a = 1$: Solve by completing the square. Write your answers as integers, proper or improper fractions in simplest form, or rounded to the nearest hundredth. (J8)

\[ d^2 + 4d - 47 = 0 \]

15) Complete the Square when $a \neq 1$: Solve by completing the square. Write your answers as integers, proper or improper fractions in simplest form, or rounded to the nearest hundredth. (J8)

\[ 4g^2 + 96g = 188 \]
HSA-REI.B.4b
(Chapter 3.1, 3.3 and 3.4, J4, J5, J9) – 5 questions

- **Solve quadratic equations by inspection** (e.g., for \( x^2 = 49 \)), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as \( a \pm bi \) for real numbers \( a \) and \( b \).

16) Inspection: solve for \( p \). Write your answer(s) in simplified, rationalized form. (J4)

\[ p^2 = 36 \]

17) Taking the Square Root: solve for \( v \). Write your answer(s) in simplified, rationalized form. (J4)

\[ v^2 + 81 = 0 \]

18) Taking the Square Root (Complex): solve for \( v \). Write your answer(s) in simplified, rationalized form. (J4)

\[ -100v^2 - 2 = 0 \]
19) Completing the Square: Complete the square. Hint: your answer should be a whole number. (J7)
\[ p^2 - 26p + \_ \_ \_ \_ \]

20) Quadratic Formula: Solve for h. Write your answer(s) in simplified, rationalized form. (J9)
\[ 3h^2 - 8h - 6 = 0 \]