Name_____

ALGEBRA II JOURNAL
Square Roots & Complex Numbers

1. When multiplying or dividing square roots, they may contain _____ values. When adding or subtracting square roots, they must contain _____ values.
2. (a) If the denominator of a fraction contains a single square root, it can be moved to the numerator by _____

   _____

   (b) If the denominator of a fraction contains a square root plus another number $(a + \sqrt{b})$, it can be moved to the numerator by multiplying by _____ which is called the _____.

   (c) When a square root is moved from the denominator of a fraction to the numerator, the process is called _____.
3. When solving an equation like $x^2 = 81$, you must _____ and remember to add _____ to your answer.
4. Numbers that result from the square roots of negative numbers are called _____ numbers.
5. Complex numbers earn this name because they have two parts: _____ and _____.
6. ALL numbers are _____ numbers.
7. The value of *i* to a very large power can be found by _____

   _____.
8. Before performing any arithmetic operation (+, - , x, /) between the square roots of two negative numbers, you must first _____
9. If a fraction has only $4i$ in the denominator, you would move it to the numerator by _____

   _____.
10. If a fraction has $2 + 5i$ in the denominator, you would move it to the numerator by _____

    _____.
11. (a) The Mandelbrot Set is an example of a _____ whose primary characteristic is _____.

    (b) The Mandelbrot Set is created on a coordinate axis in which the *x*-axis is the _____ axis and the *y*-axis is the _____ axis.

    (c) The Mandelbrot Set is created with the function $f(x) =$ _____ through the process of iteration.

    (d) Show 3 iterations of the function $f(x) = x^2 - 10$ beginning at *x* = the last digit of your calculator number. (Example: If your calculator number is NC95, iterate using *x* = 5.)

12. Important Rules, Formulas, Etc.
    a) $i =$ _____

    b) List the 4 powers of *i* and the saying for how to remember them.