Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit 4 Test REVIEW!

(Part 1) Period \_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**SHOW ALL WORK. NO WORK = NO CREDIT!**

Write your answer in standard form. Rationalize denominators where applicable.

**Topic 1 Complex Numbers. (Calculators not permitted on this topic.)** For extra notes / practice, look in Section 4.4 of the McGraw Hill Algebra 2 textbook.

1. **Extended Response.**
   1. Simplify . Describe the pattern in the values for the powers of *i*.
   2. Consider , , and .

a. Evaluate , , and .

b. *Explain* why an even power of *i* is always a real number.

1. **Multiply.** Give your answer in standard complex form.
   1. 
   2. 
2. **Divide.** Be sure to rationalize denominators.
   1. 
   2. 
   3. 
3. **Add / Subtract.** Simplify each expression as much as possible.
   1. 
   2. 
   3. 
   4. 

**Topic 2: Solve Quadratic Equations with Complex Solutions** For extra notes / practice, look in Section 4.3., 4.5, and 4.6 of the McGraw Hill Algebra 2 textbook.

1. Solve each equation. Solutions may or may not be complex.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **a.** | **Solving Quadratic Equations by Taking**  **Square Roots**   1. (*x* – 2) 2 = -36 2. -2(5*x* + 3) 2 = 32 3. 4*x* 2 – 200 = 300 4. 3(*x* + 4) 2 – 5 = 55 5. 100 – 2(*x* + 1) 2 = 0 6. 30 – *x*2 = 10 | **b. Solving Quadratic Equations by Factoring** (Hint: Write in standard form)   1. x2-x+6=8 2. 5x2-4x=12 3. 8x2+x-7=0 4. x2+14x+13=0 5. 9x2-30x+25=0 6. 12x2-3x=0 |  |
|  | **c.** | **Solving Quadratic Equations by Completing the Square** | **d. Solving Quadratic Equations by the Quadratic Formula** |  |

**e. Analyze Solutions of a Quadratic Equation with the Discriminant**

1. State the discriminant of the quadratic. 
2. Use the discriminant to determine the type solutions of the equation. 
3. Use the discriminant to determine the number of real solutions of the equation. 

**f. Extended Response - Quadratic Equations**

a. To complete the square of x2+bx, a number is added to the expression. *Explain* why the number added cannot be negative.

b. Consider the equation x2-6x=*d.* For what values of *d* will the equation have real-number solutions? *Explain*.

c. Write two quadratic equations of the form *ax2 + bx + c = 0*, one of which has real-number solutions and the other having complex-number solutions. Show that your equations have the type of solutions requested.

**Topic 3: Rational Exponents … to be continued**

1. True or False. For any integer .
2. Rewrite the expression using radical notation.
3. Rewrite the radical expression  using rational exponents.
4. Evaluate without a calculator. 813/4