CCSS Advanced Algebra 4 Quadratic Formula Review Name_____

1. Factor the polynomial $f(x) = x^2 + 8x - 20$ and use the factors to find the x-intercepts of the function.

2. Explain why you can't factor $g(x) = x^2 + 8x - 1$. How could you solve the equation $x^2 + 8x - 1 = 0$?

3. The Quadratic Formula ( $ax^2 + bx + c = 0,\ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ ) is a shortcut for a long process of solving Quadratic Equations that CANNOT BE FACTORED (full mathematics of the shortcut). To use the shortcut, you follow three steps:

- Make the equation to be solved in the form $ax^2 + bx + c = 0$ -- it is essential to have the equation =0.
- Identify the values of a, b and c from the equation (these are the coefficients on the $x^2$ term, the $x$ term and the constant coefficient.
- Use a calculator to evaluate $x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$ and $x = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$ to determine the solutions.

Use the Quadratic Formula to solve each equation below:

a. $2x^2 + 3x - 7 = 0$ b. $x^2 - 4x - 2 = 0$ c. $x^2 = 3x - 19$

4. All of the above examples, have 2 solutions. Is it possible for a Quadratic Equation to have only 1 solution? Explain why or why not. How could using the Quadratic Formula give you only one solution?

5. The equation $x^2 + 6x + c = 0$ has only one solution. What must be true about c? How do you know?

6. Show that $4x^2 + 4x = -1$ has only one solution.

7. Is it possible that a Quadratic Equation has zero real solutions? Explain why or why not. How could using the Quadratic Formula give you no real solutions?

8. The equation $x^2 + 6x + c = 0$ has no real solutions. What must be true about c? Be specific.

9. For each Quadratic Equation below, determine whether the equation has 2 real solutions, 1 real solution or no real solutions?

   a. $x^2 = 7x - 2$ b. $-10x^2 + 60x - 90 = 0$ c. $0.25x^2 = 3.11x - 18.2$

10. Show that the quadratic function $f(x) = x^2 + 1$ has NO REAL ROOTS.