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](https://www.mathsisfun.com/algebra/quadratic-equation-derivation.html)). 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:

1. $2x^{2}+3x-7=0$ 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?

1. $x^{2}=7x-2$ 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.