**Activity 2.3.4 Complex Solutions to Quadratic Equations**

Solve the following Quadratic Equations, any method. If the solutions are complex, be sure to write them in a + bi or a - bi form.

1a. Solve, write the solutions in a + bi or a - bi form: $x^{2}-2x+10=0$

b. Check one of your solutions to the equation by substituting it into the original equation for x, simplifying and confirming that the resulting statement is true.

c. Sketch a graph of the function $f\left(x\right)= $ $x^{2}-2x+10$ .

d. The equation in 1a. has no real roots. How is this fact shown (or not shown) on the graph of f(x) in 1c?

Solve the following Quadratic Equations, any method. If the solutions are complex, be sure to write them in a + bi or a-bi form.

 3. $4x^{2}-8x+3=0$ 4. $4x^{2}+8x-3=0$

5. $ 9x^{2}+12x+4=0$ 6. $9x^{2}+3x+1=0$

7. $4x^{2}-1=0$ 8. $4x^{2}+1=0$

9. For the equations that have complex solutions, describe how the two solutions are related.

10. Does every quadratic equation have at least one solution? Explain.