CCSS Advanced Algebra 3 AA1 Solving Equations Retention Review

1. Solve each equation below for x without graphing. Show all of your work.

a. $\frac{x+1}{2} - 3 = \frac{x}{4}$ b. $x^2 + 3x - 18 = 0$ c. $2(x-1)^2 + 3 = 131$ d. $4|x+6| - 1 = 7$

e. $2\sqrt{x+10} - 1 = 5$ f. $\frac{x^3+7}{5} = 3$ g. $\sqrt[3]{2x-1} = -1$ h. $(x-1)(x+5) = 0$

2. Solve each inequality below. Show your work. Represent your solution on a number line and as an inequality.

a. $\frac{x+1}{2} - 3 \leq \frac{x}{4}$ b. $x^2 + 3x - 18 < 0$ c. $2(x-1)^2 + 3 \geq 131$ d. $4|x+6| - 1 > 7$

e. $2\sqrt{x+10} - 1 < 5$ f. $\frac{x^3+7}{5} \leq 3$ g. $\sqrt[3]{2x-1} \geq -1$ h. $(x-1)(x+5) < 0$

3. Use the TI-84 or desmos.com to solve the equations below. Round your answers to 2 decimal places. Sketch the graph you used to find your solution.

a. $x^3 - 2 = 2x + 1$ b. $\sqrt{2x + 3} = x^2$ c. $3^x - 4x = 5 - 2x$

4. Solve the equations below by factoring and using the Zero Product Property:

a. $x^2 + 3x - 18 = 0$ b. $x^2 + 4x + 4 = 0$ c. $x^2 - 5x = 0$