Honors Algebra II **Name** _____

Unit 5B Review – Radicals, Absolute Value, Piecewise, and Step Functions

1. Simplifying Radicals
   a. $4x^2y^4\sqrt[3]{144x^5y^7}$

2. Multiplying and Dividing Radicals
   a. $\sqrt[4]{2250x^5y} \cdot \sqrt[4]{540xy^3}$
   b. $\sqrt[3]{\frac{2250x^5y}{540xy^3}}$
   c. $\sqrt[3]{16} \cdot \sqrt[4]{64}$

3. Adding and Subtracting Rationals and Radicals
   a. $\sqrt[3]{40x^4} - \sqrt[3]{27x} + 3\sqrt[3]{8x}$

4. Solving Radicals and Absolute Value functions (check for excluded values or extraneous solutions)
   a. $6\sqrt{5-c} - 7 = 11$
   b. $\sqrt{15x+10} = 2x + 3$
   c. $\sqrt{-x-1} = x + 1$
   d. $\sqrt[3]{5x+2} = -4$
   e. $-2|x-5| + 1 = -5$

5. Graphing Radicals and Absolute Values with Transformations (without Calculator)
   a. $\sqrt{x-5} + 2$
   b. $-\sqrt{-x} - 3$
   c. $-\sqrt[3]{x+3} - 4$
   d. $2|x-4| + 1$
   e. $-\frac{1}{3}|x+2| + 6$

6. Solving and Graphing Inequalities
   a. $\sqrt{x+7} - 8 \leq -3$
   b. $3|x-1| \geq -6$

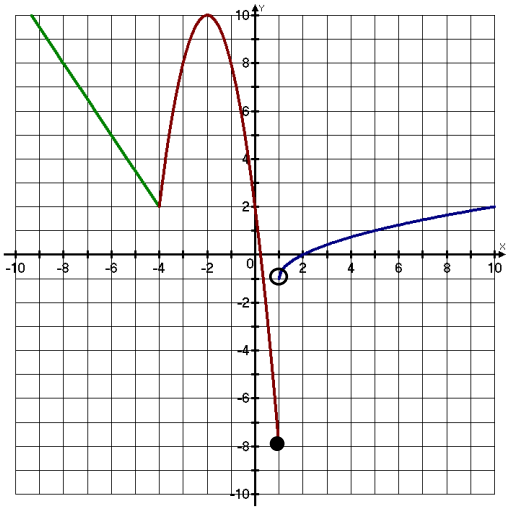
7. Greatest Integer and Step Functions
   a. Evaluate $[\![x]\!]$ for 3.7, 0.8, -2.9, π, and $-\sqrt{5}$.
   b. Graph (without calculator) $f(x) = -3[\![x]\!] - 4$

8. Graph and Evaluate Piecewise functions.

   a. Graph (without calculator) $f(x) = \begin{cases} 2x+3 & x < -1 \\ -(x-3)^2 + 1 & -1 \le x \le 5 \\ -3 & x > 5 \end{cases}$

   b. Evaluate f(x) for -2, -1, 2, 5, and 7.

   c. Write the equation for the following graph:



9. Verifying Inverses

   a. Verify that $f(x) = \frac{1}{2}\sqrt{x+2}$ and $g(x) = 4x^2 - 2$ are inverses.

10. Find the inverse of the following functions. Also find the domain and range of both the original function and the inverse.

    a. $m(x) = 5\sqrt{3x+1} - 4$

    b. $f(x) = -\frac{1}{3}\sqrt[3]{x-4} + 2$

    c. $j(x) = -\sqrt{-\frac{1}{3}x - 2} + 7$

11. Write Absolute Value Functions as a Piecewise Function

    a. $g(x) = \frac{1}{4}|x-8| + 6$

    b. $f(x) = -5\left|\frac{1}{3}x + 2\right| - 1$

    c. $j(x) = -\frac{2}{5}|-3x - 9|$