Math142 Week In Review # 2

The Most Important Problems to Understand - This Week

1. Which of the following represent functions:

   a. $f(x) = 3x^2 - 2x + 9$

   b. $g(x) = \mid 2x - 1 \mid$

   c. $x = 3y - 2$

   d. $x = y^2 + 2y + 1$

   e. The pairing of each student in my class with their phone number.

2. Find the domain of each of the functions below:

   a. $y = \dfrac{3x + 12}{x^2 - 9}$

   b. $y = \sqrt[3]{x + 1}$

   c. $f(x) = \begin{cases} \dfrac{x+4}{x^2-9}, x < 0 \\ \dfrac{x^2-16}{x-4}, x \geq 1 \end{cases}$

3. Given: $f(x) = x^2 + 2x + 1, g(x) = \sqrt{x - 1}$, $h(x) = \dfrac{x+1}{x-2}$, evaluate:

   a. $f(2) + g(5) - 6h(3)$

   b. $\left(\dfrac{f}{h}\right)(10)$

   c. $(f \circ g)(10)$

4. Find the difference quotient when:

   a. $f(x) = 2x^2 - 3x + 4$

   b. $g(x) = \dfrac{x+2}{x-3}$

   c. $F(x) = \sqrt{2x + 5}$

5. The price-demand function for Helium Balloons INC is $p = 8 - 0.5x$. The maximum quantity one can order each day is a dozen. Find the price which maximizes daily revenue.

6. Describe the function:

   a. $y = 4(x + 2)^2 - 3$

   b. $y = -2\sqrt{x - 1} + 4$

   c. $y = - \mid x + 5 \mid +3$

   d. $y = 4x^2 - 24x + 5$

7. Find all intercepts:

   a. $y = 2(x - 1)^2 + 3$

   b. $y = \frac{1}{2}(x + 5)^2 - 8$

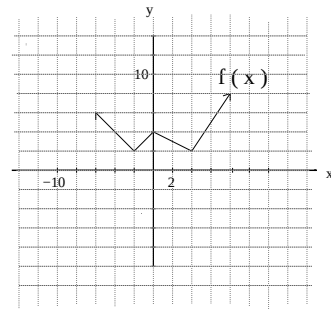
   c. $y = 4x^2 + 8x - 12$

8. Helium Balloon INC (see above) has fixed costs of \$10/day and variable costs of \$2/balloon. Find the break even point(s).

9. Using the graph of $f(x)$ below, sketch the graph of each of the following functions.

   a. $y = -f(x - 2)$

   b. $y = 2f(x) + 3$



10. Write the equation of the parabola which opens up, passes through the point $(-4, 8)$ and has a vertex at $(1, -2)$.

11. Given $p(x) = 105.7 - 0.89x$ and variable costs are \$80/unit and fixed costs are \$61.80.

    a. Find the cost equation.

    b. Find the revenue equation.

    c. Find the profit equation.

    d. Find the break even point.

12. Determine if each of the following is a polynomial:

    a. $f(x) = 5x^2 - \pi x + 4$

    b. $g(x) = 3x - \dfrac{2}{x^{-3}} + 10$

    c. $h(x) = \sqrt{16x^3}$

    d. $F(x) = 3ix^2 + 9$

    e. $G(x) = \dfrac{x^2 - 4x - 12}{x^2 - 6x + 9}$