

Math142 Week In Review # 2

The Most Important Problems to Understand - This Week

1. Which of the following represent functions:

a. $f(x) = 5x^2 - x + 11$

b. $g(x) = |5 - 3x|$

c. $4x = 9y^2 + 25$

d. $y = x^3 - 9$

e. $x = 5$

f. $y = 1$

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

h. The pairing of the name of a city, and the country where that city is located.

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

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

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

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

d. $y = \sqrt[4]{2x + 9}$

e. $f(x) = \frac{\sqrt{40 - 2x}}{\ln(x - 5)}$

3. Given: $f(x) = x^2 + x - 4$, $g(x) = \sqrt{x + 3}$,

$h(x) = \frac{3x + 1}{5x - 20}$, evaluate:

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

b. $\left(\frac{f}{g}\right)(1)$

4. Find the difference quotient when:

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

b. $g(x) = \frac{x + 4}{x - 2}$

c. $F(x) = \sqrt{2x - 3}$

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. The price-demand function for Drost's Better Brownies is $p = 22 - 5x$, where x represents the number of dozens of brownies ordered, and p is the price/brownie in dollars. Find the revenue when an order is received for 48 brownies. What is the domain of the function?

7. Describe the function:

a. $y = (x - 3)^2 + 10$

b. $y = -2\sqrt{x - 3} + 5$

c. $y = -|4 - 2x| + 1$

d. $y = 6x^2 - 24x - 3$

8. Find all intercepts:

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

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

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

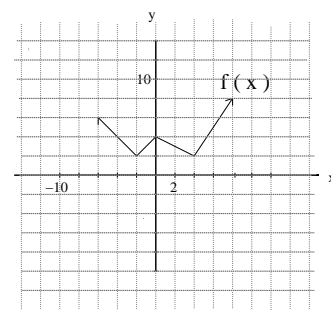
9. Helium Balloon INC (see # 5 above) has fixed costs of \$10/day and variable costs of \$2/balloon. Find the break even point(s).

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

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

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

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



11. Write the function $f(x) = -5x^2 - 30x + 27$ in vertex form and describe its graph related to its parent function.

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

13. 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.

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

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

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

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

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

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

15. What is the equation of $g(x)$ which is formed by shifting the graph of $f(x) = \sqrt{x}$, two units right, reflecting it about the x -axis, and moving it up three units.