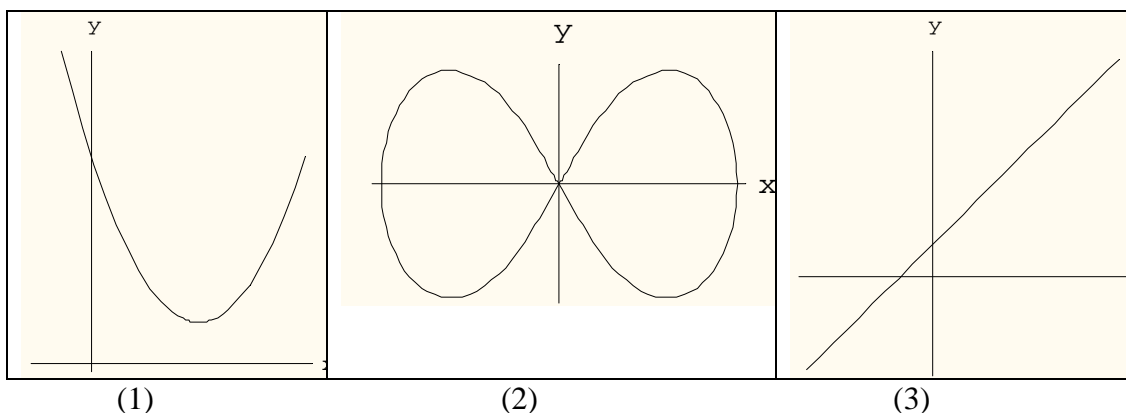


Post-Test Algebra

1. If $f(x) = -2x^2 + 4x - 6$, find $f(0)$, $f(-2)$, and $f(2+h)$, h a real number.
2. Let $g(x) = \frac{2x+1}{x^2-5x+6}$. Find, if possible, $g(0)$, $g(-2)$ and $g(3)$.
3. Consider the following three graphs:



- a. Which, if any, of the three graphs is *not* the graph of a function?
 - b. Which, if any, of the graphs is the graph of a one-to-one function?
 - c. Which, if any, of the three graphs appears to be the graph of a function of the form $f(x) = ax^2 + bx + c$?
4. The first four terms of a sequence are given. Assuming that the pattern continues as indicated, find a formula for the n th term a_n .
 - a. $\frac{2}{3}, \frac{4}{5}, \frac{6}{7}, \frac{8}{9}, \dots$
 - b. $\frac{-1}{4}, \frac{2}{9}, \frac{-3}{16}, \frac{4}{25}, \dots$
 5. Determine whether given sequence can be the first three terms of an arithmetic or geometric sequence and, if so, find the common difference or common ratio and the next two terms.
 - a. $-1, -4, -7, \dots$
 - b. $1, 4, 9, \dots$
 - c. $2, -4, 8, \dots$
 - d. $\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \dots$

6. The graph of the function $f(x) = -2x + 3$ is a straight line. Give the slope, the y -intercept, and draw the graph.
7. Write an equation for the line that passes through the points $(-1, 3)$ and $(1, -1)$ and sketch its graph.
8. Find the slope, the x - and y -intercepts and sketch the graph of the line with equation $3x - 2y = 8$.
9. Each of the following pairs of equations represents two straight lines in the plane. In each case, determine whether the lines have a unique point of intersection, are parallel, or are coincident. If the lines have a unique point of intersection, find it.

a. $\begin{cases} x - 2y = 4 \\ -2x + 4y = -8 \end{cases}$

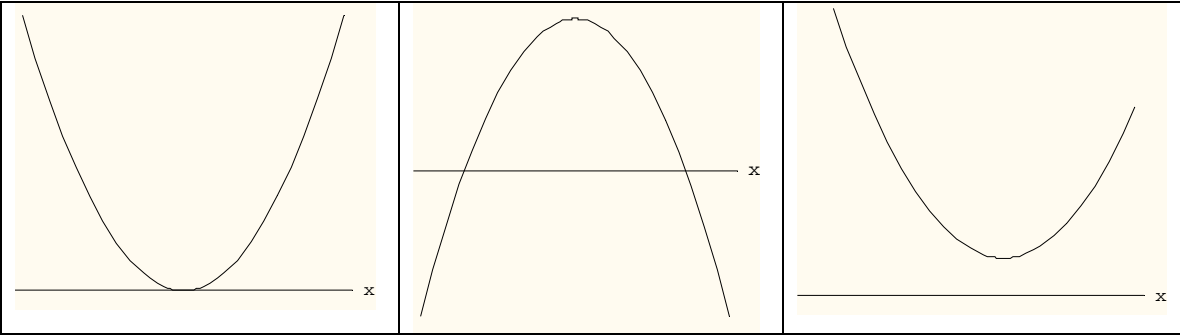
b. $\begin{cases} 2x - y = 5 \\ 5x + 2y = 8 \end{cases}$

c. $\begin{cases} 2x + y = 4 \\ 4x + 2y = -8 \end{cases}$

10. Suppose that ten years ago you put \$1000 into a savings account that draws simple interest, and suppose that there is \$1600 in the account now. Use the fact that the amount in the account at time t is a linear function of t to find the interest rate r . How much will be in the account three years from now?
11. Each of the following is a quadratic in factored form. Write each in the form $ax^2 + bx + c$.
- a. $(x - \sqrt{5})(x + \sqrt{5})$ b. $(x - 2)(x + 6)$ c. $(3x + 1)(2x + 3)$
12. If possible, factor the quadratic expression into a product of linear factors with real coefficients. If it is not possible, explain why.
- a. $x^2 - 3$ b. $x^2 + 8x + 16$ c. $x^2 - 6x + 13$
13. Sketch the graph of the parabola $f(x) = x^2 - 2x + 3$. Label the vertex, the x -intercepts (if any), and the y -intercept.
14. Use the quadratic formula to find the solutions, if any, of the given equation.
- a. $x^2 - 4x - 2 = 0$ b. $6x^2 - x - 1 = 0$ c. $2x^2 - 4x + 5 = 0$
15. Each of the following curves is the graph of a quadratic function

$$f(x) = ax^2 + bx + c.$$

In each case state whether $b^2 - 4ac$ is positive, negative or zero.



(a)

(b)

(c)