Algebra 2: Exam 5 Review **Mr. Shahom**

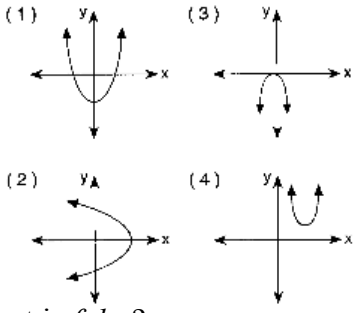
- Solving quadratic equations by completing the square
- Solving quadratic equations by using the Quadratic Formula
- Definition of a Relation
- Domain and Range
- Definition of a Function
- Vertical Line Test
- Function Notation
- Graphing linear functions ($y = mx + b$)
- Applications of linear functions (e.g., cost, revenue, profit)
- Graphs of quadratic functions (know axis of symmetry: $x = \frac{-b}{2a}$)
- Writing quadratic equations in vertex form ($y = a(x-h)^2 + k$, where (h,k) is the vertex)
- Understanding how the value of *a* affects the shape of the parabola and the direction of opening.
- Graphing quadratic functions using the graphing calculator (setting an appropriate window, finding zeros, maxima, minima, intersections, etc.)

Practice:

1. The domain for $f(x) = x^2 - 3$ is $0 \le x \le 4$. The smallest value in the range of $f(x)$ is
   (1) 0 (3) –3
   (2) 16 (4) 4

2. If $f(x) = kx^2$ and $f(2) = 12$, then what is the value of *k*?

3. Which diagram does *not* represent a function?



4. If $g(x) = \{(5,-3), (3,-5), (1,-7), (-4,-7), (-5,10)\}$, which statement is *false*?
   (1) $2 \cdot g(3) = g(1) - 3$ (3) $\frac{g(-4)-1}{g(3)} = -2$
   (2) $g(5)g(1) = 21$ (4) $-g(5) - g(-5) = g(-4)$

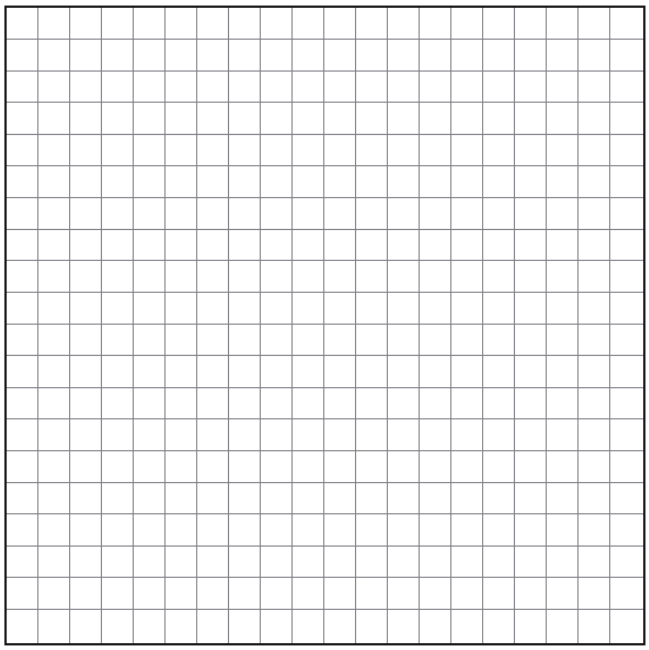
5. The height, *h*, in feet, a ball will reach when thrown in the air is a function of time, *t*, in seconds, given by the equation $h(t) = -16t^2 + 30t + 6$. Find, to the *nearest tenth*, the maximum height, in feet, the ball will reach.

6. What is the axis of symmetry of the parabola represented by the equation $y = 2x^2 + 16x - 11$?

7. If $h(x) = \frac{2x^2 - 3}{3x}$, find $h(-2)$ and state the domain of h.

8. When a current, I, flows through a given electrical circuit, the power, W, of the circuit can be determined by the formula $W = 120I - 12I^2$. What amount of current, *I*, supplies the maximum power, *W*?

9. Abigail, who has a bionic arm, is crossing a bridge over a small gorge and decides to toss a coin into the stream below for good luck. The distance of the coin above the water can be modeled by the function $h(t) = -16t^2 + 96t + 112$, where t measures time in seconds and h measures the height, in feet above the water. Graph the function on the accompanying grid. Find the greatest height the coin reaches before it drops into the water below and find the time at which the coin hits the water.



10. Which is the range of the relation $f(x) = 3x^2 - 5x$ if the domain is $\{0,1,2\}$?

(1) $\{0,1,2\}$ (3) $\{-1,-2,0\}$

(2) $\{-2,0,2\}$ (4) $y \geq 0$

11. The revenue, $R(x)$, from selling x units of a product is represented by the equation $R(x) = 35x$, while the total cost, $C(x)$, of making x units of the product is represented by the equation $C(x) = 20x + 500$. The total profit, $P(x)$, is represented by the equation $P(x) = R(x) - C(x)$. For the values of $R(x)$ and $C(x)$ given above, what is $P(x)$?

(1) $15x$ (3) $15x - 500$

(2) $15x + 500$ (4) $10x + 100$

12. Solve for x in simplest radical form by completing the square:

a) $x^2 - 4x - 8 = 0$

b) $4x^2 - 2x - 5 = 0$

13. Solve for x using the quadratic formula:

a) $x^2 + x - 4 = 0$

b) $3x^2 - 6x = 7$

14. Solve for x: $6x^2 + 11x - 35 = 0$

15. Write the function $f(x) = 3x^2 + 2x - 1$ in vertex form and state the coordinates of the vertex.