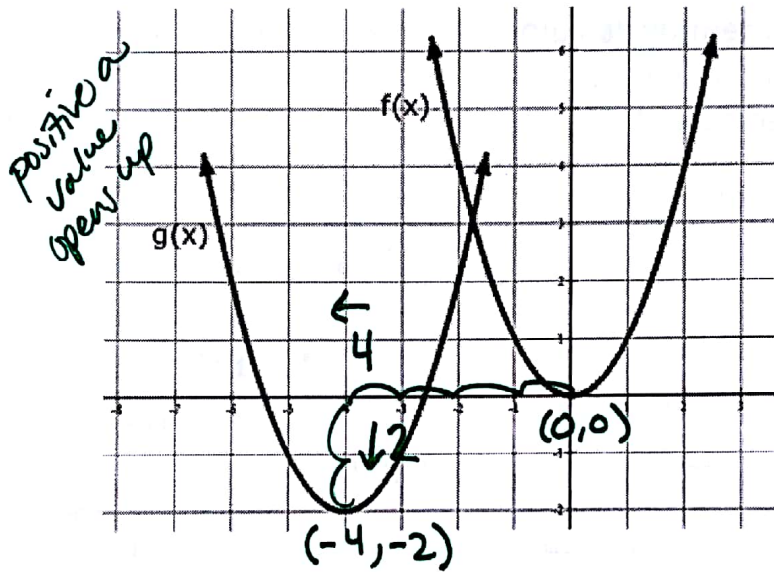


# Test Review: Quadratics **KEY**

Quadratic Formula  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

1. In the grid below, graph of the equation  $f(x) = x^2$  is transformed to create  $g(x)$ . Which equation best represents the graph of  $g(x)$ ?



$(x+4)^2 - 2$

- A  $g(x) = (x-4)^2 - 2$
- B  $g(x) = (x+4)^2 - 2$**
- C  $g(x) = (x-4)^2 + 2$
- D  $g(x) = (x+4)^2 + 2$

2. A quadratic function is described as  $f(x) = 2(x^2+3)$ . The parabola is then translated 10 units down. What is the equation of the new function?

$2x^2 + 6 - 10 = 2x^2 - 4$

- A.)  $y = x - 6$
- B.)  $y = x^2 - 4$
- C.)  $y = 2x^2 - 4$**
- D.)  $y = 2x^2 - 6$

3. Free response... What transformation occurs when the quadratic parent function is multiplied by negative 1?

$y = x^2$   $\longrightarrow$   
 $y = -1x^2$  The graph opens downward.

4. What are the synonyms of x-intercepts? Zeros Solutions roots

5. What is the solution set for  $2x^2 - 9x = 18$ ?  $2x^2 - 9x - 18 = 0$  graph trace

- A.)  $\{-1.5, 6\}$  B.)  $\{0, 6\}$  C.)  $\{1.5, -6\}$  D.)  $\{-2, 7\}$

$$\frac{9 \pm \sqrt{(-9)^2 - 4(2)(-18)}}{2(2)} = \frac{9 \pm 15}{4} = \frac{24}{4} = 6 \quad \frac{-6}{4} = -1.5$$

6. What is the factorization of  $f(x) = x^2 - 9$ ? use answer choices and foil or box method

- A.  $(x-3)^2$  B.  $(x-3)(x+3)$  C.  $(x+3)^2$  D.  $(x-1)(x+9)$

$$x^2 + 3x - 3x - 9$$

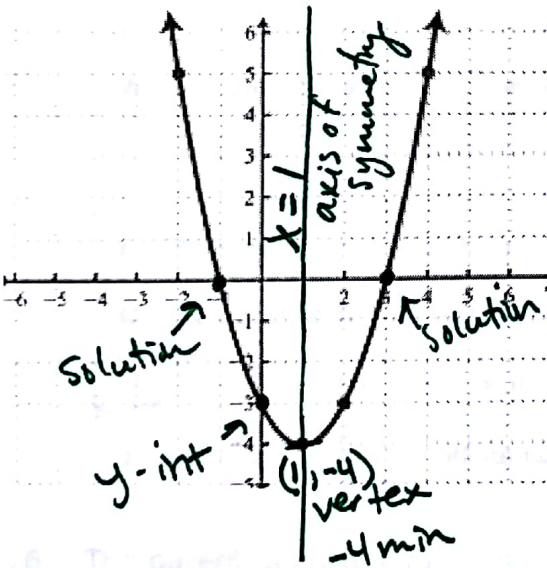
7. A diver jumps from a cliff into the ocean. He jumps at 80 feet above the water. After one second, he is 69 feet above the water. At 2 seconds, he is 26 feet above the water. At what time will he land in the water? (Round to the tenths place)

- A.) 2.2 seconds B.) 2.4 seconds C.) 2.6 seconds D.) 3.1 seconds

$(0, 80)$  List and spreadsheets  
 $(1, 69)$  x y  
 $(2, 26)$  ctrl del, 5

menu 4/64  
 $y = -16x^2 + 5x + 80 \rightarrow$  graph trace  
 menu 4a  $\rightarrow$  zoom fit  
 menu 5/1 2

8.) Key Features of a parabola.



- A. What are the solutions?  $\{-1, 3\}$   
 B. What is the y-intercept?  $y = -3$   $(0, -3)$   
 C. What is the equation for the axis of symmetry?  
 $x = 1$  (not tied to a real situation)  
 D. What is the domain? all real numbers  
 E. What is the range?  $y \geq -4$   
 F. Using the three key points, find the equation to this quadratic.  $(-1, 0), (0, -3), (1, -4), (3, 0)$  #7  
 $y = x^2 - 2x - 3$   
 G. What is the minimum? (Remember... you only give the y-value)  $y = -4$

9. A baseball is hit, the height (h) in feet of the ball above the ground (t) seconds after it is hit can be approximated by the equation  $h = -16t^2 + 64t + 3$ . What is the maximum height of the ball?  $\rightarrow$  y value of vertex graph, zoom fit, graph trace (4a)

- A.) 4.1 feet B.) 60 feet C.) 55 feet D.) 67 feet

x values

10. What is the domain of the quadratic parent function?

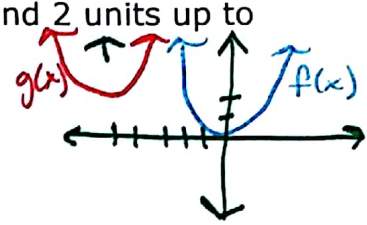
- A. all real numbers
- B.  $y \geq 0$
- C.  $x \geq 0$
- D.  $x \leq 0$

11. What is the range of the quadratic parent function?

- A. all real numbers
- B.  $y \geq 0$
- C.  $x \geq 0$
- D.  $y \leq 0$

12. The quadratic parent function,  $f(x)$  is translated 5 units to the left and 2 units up to create  $g(x)$ . What is the range of  $g(x)$ ?

- A. all real numbers
- B.  $y \geq 2$
- C.  $y \geq 5$
- D.  $y \leq 2$



13. What are the solutions to the equation  $x^2 + 5x = 5x - 25$  ? put in  $ax^2 + bx + c$  form graph trace

- A.) no solutions
- B.) {5}
- C.) {-5, 5}
- D.) {0, 10}

graph does not touch x-axis. starts @ 25, opens up.

$x^2 = -25$   
 $+25 \quad +25$

$x^2 + 25 = 0$

14. The parent function is described as  $f(x)$ . The function  $g(x) = \frac{1}{8}f(x)$ . How does  $g(x)$  compare to  $f(x)$ ? Complete the sentence...  $G(x)$  \_\_\_\_\_ compared to  $f(x)$ .

- A.) Gets narrower.
  - B.) Gets wider.
  - C.) Goes up 0.125
  - D.) Goes left
- Small value gets wider

15. Which statement about the quadratic equation below is true?

$-4.5x^2 + 72 = 0$  graph trace

- F The equation has  $x = 4$  as its only solution.
- G The equation has no real solutions.
- H** The equation has  $x = 4$  and  $x = -4$  as its only solutions.
- J The equation has an infinite number of solutions.

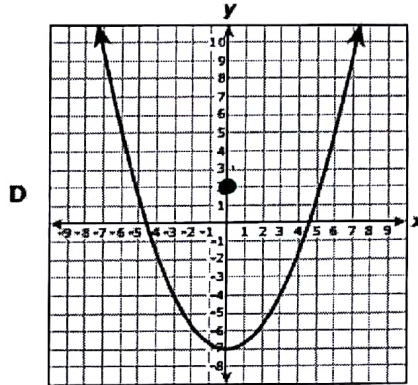
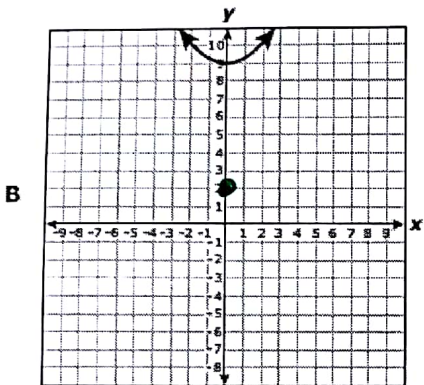
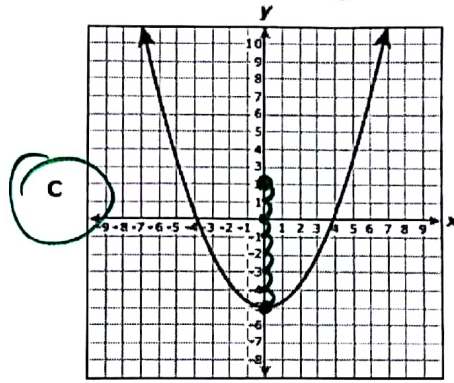
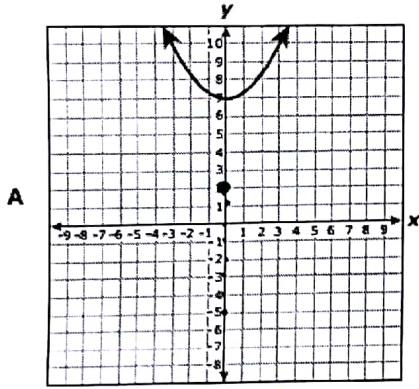
16. The parent quadratic function is  $f(x)$ .  $f(x)$  was translated to create  $g(x) = (x + 5)^2 + 9$ . What is the x-coordinate of the vertex of  $g(x)$ ?

- A. 5
- B. -5**
- C. 9
- D. 0

x value shifted left 5

17. Which graph can be obtained by translating the graph of  $h(x) = 0.33x^2 + 2$  down 7 units?

*y-intercept so it must start there and move 7 down*



18. A quadratic equation is  $f(x) = 2(x - m)^2 + r$ . Where is the vertex of  $f(x)$ ?

- A.  $(-m, r)$       B.  $(0, 0)$       C.  $(m, -r)$       **D.  $(m, r)$**

19. What is the positive solution to the equation  $0 = 1/3x^2 - 6$  *graph trace, only write positive root*

**$(4.24, 0)$**

20. One of the solutions to a quadratic function,  $f(x)$  is 0. What is the other solution?

*x-intercept  $(x, 0)$  when  $y = 0$*        **$-5$**

X	-6	<b>-5</b>	-2	1	2
f(x)	6	<b>0</b>	-6	6	14

21. Solve the equation  $f(x) = x^2 + 2x - 15$  by using the quadratic formula.  $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

**$\{-5, 3\}$**

$a=1 \quad b=2 \quad c=-15$

$$\frac{-2 \pm \sqrt{2^2 - 4(1)(-15)}}{2(1)} = \frac{-2 \pm \sqrt{4+60}}{2} =$$

$$\frac{-2 \pm \sqrt{64}}{2} = \frac{-2 \pm 8}{2} = \frac{-2+8}{2} \text{ and } \frac{-2-8}{2} = \frac{6}{2} = \mathbf{3} \quad \frac{-10}{2} = \mathbf{-5}$$