Name _____ Class _____ Date _____

# Algebra 1 Review CYU: Quadratic Functions DAY TWO

☑ *Use when you get it right all by yourself*

***S*** *Use when you did it all by yourself, but made a silly mistake*

***H*** *Use when you could do it alone with a little help from teacher or peer*

***G*** *Use when you completed the problem in a group*

***X*** *Use when a question was attempted but wrong (get help)*

***N*** *Use when a question was not even attempted*

| CONCEPTS | BASIC | INTERMEDIATE | ADVANCED |
|---|---|---|---|
| Domain/Range | 1 | 2 | |
| Vertex | 2 | 3 | 18, 24 |
| Minimum/Maximum | 2 | 3 | 5 |
| Axis of Symmetry | 2 | | 7 |
| Vertex Form | 2, 13 | 10, 12, 16 | 15, 24 |
| Standard Form | 1, 22, 23 | 3, 12, 16 | 14 |
| Solving Quadratic Equations | 4 | 6, 19, 20 | 8, 17, 18, 23 |
| Factoring | 4, 21 | 20 | |
| Completing the Square | | 20 | 17, 23 |
| Quadratic Formula | 14 | 20 | |
| Projectile Motion | | 5, 6 | |
| Zeros/Roots/x-intercepts/Solutions | 9, 14, 21, 22 | 6, 19, 20 | 8, 17, 18 |
| Transformations | 10, 13 | 11 | |
| Writing Quadratic Equations | | | 15, 18, 24 |
| Factored/Intercept/Root Form | 21 | 19 | |
| Square Root Method | | | 23 |
| Quadratic Regression | | 25 | |
| Modeling Quadratics | | | 26 |
| Finite Differences | 25 | | |

1. Graph the function $f(x) = x^2 + 2x - 8$ and identify the domain and range in interval notation. Graph on the calculator to get a visual.

**Domain: _____** **Range: _____**

2. Fill in the key features and characteristics for the function $f(x) = -(x+3)^2 - 4$ ?

Vertex: _____ Maximum or Minimum?

Axis of symmetry: _____

Domain: _____ Range: _____

3. Graph the function $f(x) = -x^2 + 2x - 8$ and identify the vertex and whether the vertex is a maximum or minimum.

Vertex: _____ Maximum or minimum: _____

4. What are the factors for the following quadratic function:

(HINT: solve by factoring)

$x^2 + 2x - 8 = 0$

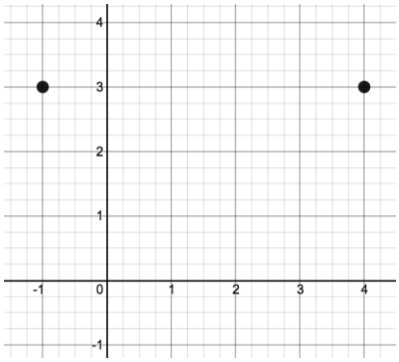
**Scenario for 5 and 6:** Suppose you shoot a small rocket in the air with an initial velocity of 120 feet per second. The equation which

represents this is $y = -15x^2 + 120x$ where y is the feet the rocket is above the ground, and x is the time in seconds from the moment the rocket was shot into the air.

5. What is the maximum height the rocket reaches?

6. How many seconds does it take the rocket to touch the ground?

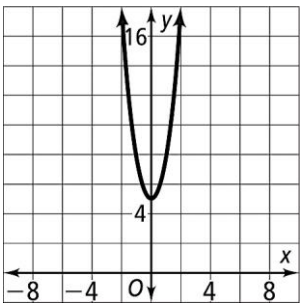
7. Two points on the graph of a quadratic function are shown in the grid below.



What is the equation of the axis of symmetry of the graph of this function?

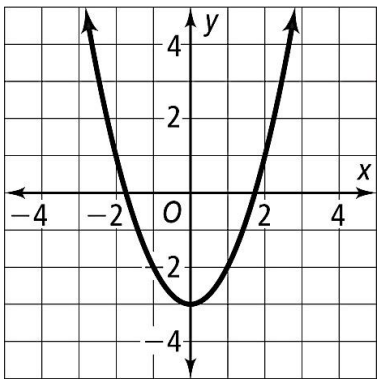
**Axis of symmetry: _____**

8. What are the solution(s) of the quadratic function graphed below?



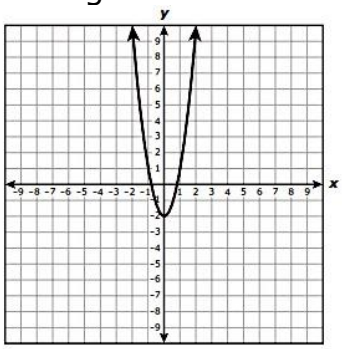

Solution(s):_____

9. The graph of a quadratic function f(x) is shown below. Based on the graph, between which two values of x is a zero of f(x) located?




10. Describe the transformation of $h(x) = 0.33(x+3)^2 - 2$ from the quadratic parent function?

11. The graph of $g(x) = x^2 - 2$ is shown below. If the coefficient of $x^2$ is changed from 1 to another positive number to create a new function, how will the graph of the new function compare with the graph of the original function?



**A** The *x*-intercepts of the new graph will be the same as the *x*-intercepts of the original graph.

**B** The vertex of the new graph will be different from the vertex of the original graph.

**C** The new graph will be wider or narrower than the original graph.

**D** The new graph will open in the opposite direction as the original graph.

12. Which shows the standard form of the function $y = -3(x-2)^2 + 1$

**F** $y = 9x^2 + 36x + 37$ **G** $y = -3x^2 + 12x - 11$

**H** $y = -3x^2 - 4x + 5$ **J** $y = -3x^2 - 11$

13. How does the function $f(x) = -(x+2)^2 - 3$ compare with the quadratic parent function?

14. Use the quadratic formula to find the zeros of: $x^2 - 2x + 7 = 0$.

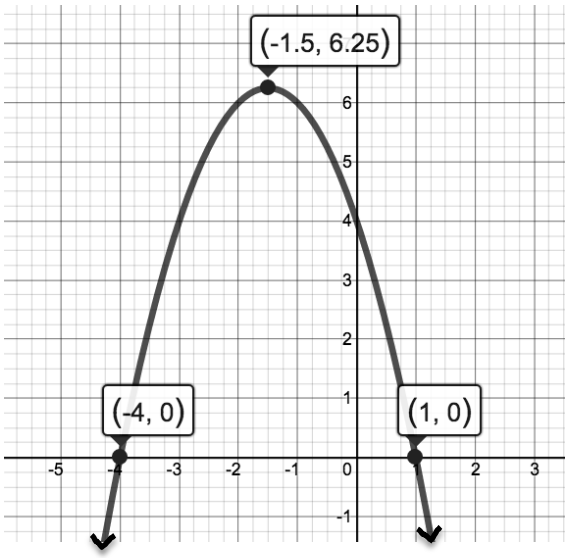
15. A parabola has vertex (2, 5) and also passes through the point (-1, 7). Write the equation of the parabola in vertex form.

16. Write the quadratic function in standard form.

$$y = 2(x-3)^2 + 5$$

17. For what value of "c" will $f(x) = x^2 + 12x + c$ have a zero at -6? (Complete the square)

18. Write the standard form equation that represents the following graph of a quadratic function.




19. What are the solution(s) for the quadratic equation $x^2 - 16 = 0$?

20. What are the root(s) for the equation $8x^2 + 2x - 3 = 0$?

21. What are the factors and solution(s) for the equation

$$2x^2 + 2x - 4$$

**F** $\boldsymbol{2(x+2)(x-1); x = -2 \text{ and } x = 1}$

**G** $\boldsymbol{(x+2)(x-1); x = -2 \text{ and } x = 1}$

**H** $\boldsymbol{2(x+2)(x-1); x = 2 \text{ and } x = -1}$

**J** $\boldsymbol{(x-4)(x+1); x = -4 \text{ and } x = 1}$

22. The x-intercepts of a quadratic equation are (0,0) and (4,0). Which quadratic equation could represent this function?

**A** $y = x^2 - 4x$

**C** $y = x^2 - 4$

**B** $y = x^2 + 4x$

**D** $y = x^2 - 4x - 7$

23. Use the quadratic formula to find the roots of: $3x^2 + 6x = -2$.

**Write your answer in radical form.**

24. Write the equation of the line that has a vertex of (3,9) and passes through the point (0,0)?

**A** $y = x^2$

**B** $y = x^2 + 6$

**C** $y = (x-3)^2 + 9$

**D** $y = -1(x-3)^2 + 9$

25. An object is launched into the air. The table below shows the object's height above the ground at various times.

| X (time) | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Y (height) | 63.5 | 156.5 | 281.5 | 438.5 | 627.5 | 848.5 |

Based on the data, which of the following is the closet to the object's height above the ground 9 seconds after being launched?

26. The function below can be used to model the area of a rectangle in square inches, *A*, if the rectangle has a perimeter of 50 inches and a width of *w* inches.

$$A = -w^2 + 25w$$

In this situation, which of the following describes the domain of the function?

**A** $0 \leq w \leq 5$ **B** $0 \leq w \leq 50$

**C** $0 \leq w \leq 20$ **D** $0 \leq w \leq 25$

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**CYU Reflection:** *How far can you go: basic, intermediate, or advanced?*

**Rate your mastery level!**

How confident are you with the skills this CYU covered? Circle the score you would give yourself.