

## Unit 6 REVIEW Quadratics Test

**Learning Target:** I can rewrite quadratic functions in equivalent forms (limited to factored form and standard form:  $ax^2 + bx + c$  form).

Simplify each expression. Rewrite in the form  $ax^2 + bx + c$ .

1.  $(3x - 4)(2 + 3x)$

2.  $3x(3x - 4)$

3.  $(2x + 5)(x - 12)$

**Solve** each quadratic equation:

4.  $x^2 + 7x + 6 = 0$

5.  $x^2 - 64 = 0$

6.  $3x^2 - 12x - 36 = 0$

7.  $3x^2 + 13x - 10 = 0$

8.  $18x^2 - 67x + 14 = 0$

**Learning Target:** I can interpret the key features in context of a quadratic function given a graph, and/or table.  
(note: key features include zeros, y-intercept, max/min, symmetry, size & direction)

**Learning Target:** I can write a quadratic function from context (limited to projectile motion).

7. A ball is launched from the top of a building. The ball follows the path of  $y = -16x^2 + 70x + 50$  where  $x$  is the time in seconds and  $y$  is the height in feet. **Show your work or explain your reasoning.**
- How tall is the building it is launched from, according to the equation?
  - How high does the ball go? How long does it take the ball to get to the maximum height?
  - When does the ball hit the ground?
  - How high is the ball after 3.5 seconds?

8. A child tosses a ball upward with a starting velocity of 10 ft/sec from a height of 3 ft. **Show your work or explain your reasoning.**
- Write an equation to find any height  $x$ .
  - If the ball is not caught, how long will the ball be in the air?
  - When will the ball reach its maximum height? What is the ball's maximum height?

**Learning Target:** I can graph a quadratic function using the key features with and without technology.

9. Without using your calculator, match each of the following rules with the correct graph below. All graphs are shown using the same window. **Explain your reasoning in each case.**

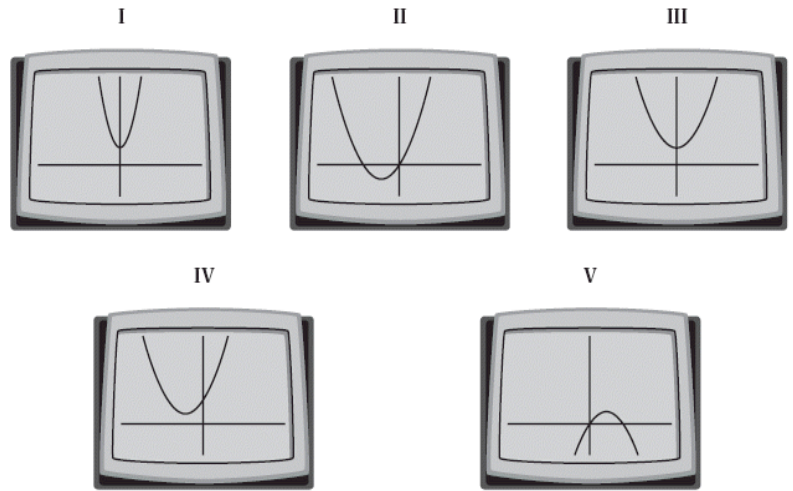
a.  $y = x^2 + 3x + 4$

b.  $y = x^2 + 3x$

c.  $y = -x^2 + 3x$

d.  $y = x^2 + 3$

e.  $y = 4x^2 + 3$



Identify the following of the function. Then draw a quick sketch of the parabola.

11.  $y = -x^2 - 3x + 28$

X-intercepts

y-intercepts

Axis of Symmetry

Vertex

12.  $y = -5x^2 + 55x - 90$

X-intercepts

y-intercepts

Axis of Symmetry

Vertex

13.  $y = 3x^2 - 35x + 11$

X-intercepts

y-intercepts

Axis of Symmetry

Vertex

Review:

14. If  $y$  varies directly as  $x$ , and  $x = 9$  when  $y = 15$ , find  $y$  when  $x = 33$ .

15. If  $y$  varies inversely as  $x$ , and  $y = 32$  when  $x = 3$ , find  $x$  when  $y = 15$ .

16. If  $y$  varies jointly as  $x$  and  $z$ , and  $y = 33$  when  $x = 9$  and  $z = 12$ , find  $y$  when  $x = 16$  and  $z = 22$ .

**Factor Completely**

\*\*GCF and then factor (D.O.S or grouping)

17)  $2x^2 - 8$

18)  $3x^2 + 4x + 4$

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