

Honors Unit 4: Quadratics Study Guide
Spring 2016

Name: _____

I. Multiplying Binomials and Trinomials: Hint- Box method or FOIL.

1. $(2x+1)(x-5)$

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

3. $(x+4y)(2x-7y)$

4. $(x+2)^2$

5. $(x^2 + 3x - 4)(-2x+6)$

6. $(3x-4)(3x^2 - x - 7)$

II. Factoring

1. $3x^2+10x-25$

2. $14z^8 + 24z^7 - 30z^3$

3. $18p^3 - 63p^2 - 9p$

4. $5x^2+75x+250$

5. $x^3 - 5x^2 - 25x + 125$

6. $81b^2 - 16c^2$

III. Solving by factoring or quadratic formula

1. Factor the trinomial $x^2 - 2x = 35$ to find the zeros

2. Find the zeros of the quadratic function $4x^2 + 8x + 7 = 4$. Write the quadratic formula used to solve and then write the solutions.

3. Using the quadratic formula, find the solutions to the equation $5n^2 + 9n = -4$

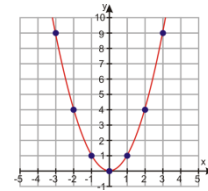
4. Find the zeros of the quadratic function $3x^2 = -10x + 25$

IV. Discriminant

1. Using the quadratic function $x^2 + 2x - 1 = 2$, identify the discriminant and the number of solutions the function will have.

2. Determine the value of the discriminant and number of solutions for the quadratic function $3x^2 - 5x + 32 = 0$.

3. Looking at the graph to the right, what do you know about the discriminant?



V. Standard form of a Quadratic ($y=ax^2+bx+c$): Be able to identify axis of symmetry, vertex, minimum or maximum, zeros and y-intercept of a quadratic function in standard form. Then graph the quadratic.

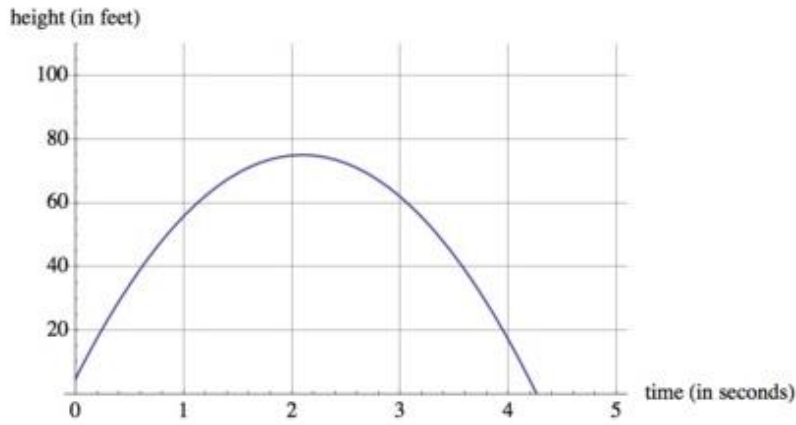
Equation	A.O.S	Vertex	Zeros	Y-Intercept	Graph
#1 $y = -2x^2 + 8x - 12$					
#2 $y = x^2 - 4$					
#3 $y = x^2 + 2x - 3$					

VI. Maximum/Minimum Comparison: Use your knowledge of quadratics to compare minimum and maximum values in application problems.

1. Suppose Brett and Andre each throw a baseball into the air. The height of Brett's baseball is given by

$$h(t) = -16t^2 + 79t + 6$$

where h is in feet and t is in seconds. The height of Andre's baseball is given by the graph below:



Brett claims that his baseball went higher than Andre's, and Andre says that his baseball went higher.

- a. Who is right? Why?

- b. How long is each baseball airborne?

2. Three teams are participating in an egg launch contest. Their results from the egg launch can be found below.

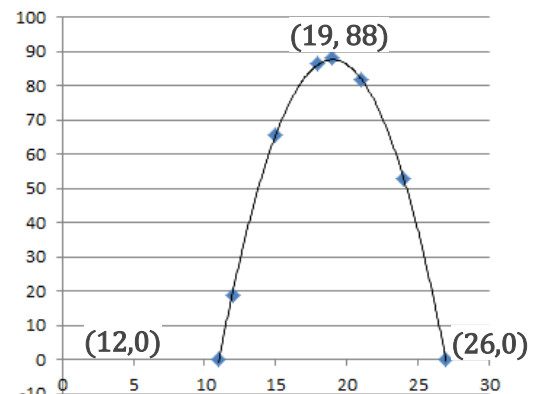
Team A

Time	Height
2	-5.2
3	9.8
6	45.2
9	66.2
12	72.8
15	65
18	42.8
21	6.2
22	-9.2

Team B

$$F(x) = -1.3x^2 + 39.6x - 195.1$$

Team C



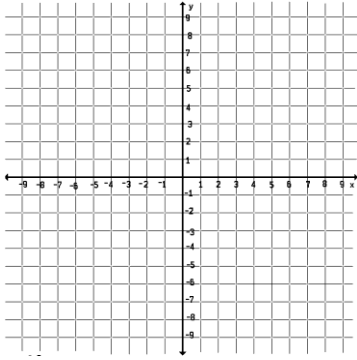
- a. Which team's egg was launched the highest? Explain how you know this.

- b. Which team's egg was launched the furthest? Explain how you know this.

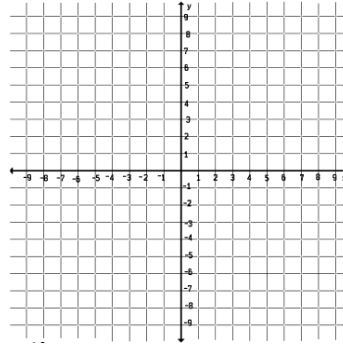
- c. Which team should win the contest and why?

VII. Graphing Quadratic Inequalities

1. Graph $y \geq x^2 - 7x + 10$



2. Graph the quadratic inequality $y < x^2 - 9$.



VIII. Linear and Quadratic Systems

1. Solve the following linear-quadratic system

$$y + x = 1$$

$$y + 2 = x^2 + x$$

2. How many solutions does each system have?

a. $y = x^2$

$$y = 2x + 3$$

b. $y = x^2 + 3$

$$x - 2y = 2$$

3. A daredevil jumps off the CN Tower and falls freely for several seconds before releasing his parachute. His height, h , in meters, t seconds after jumping can be modeled by: $h = -4.9t^2 + t + 360$ before he releases his parachute; and $h = -4t + 142$ after he releases his parachute. How long after jumping did the daredevil release his parachute?

4. A punter kicks a football. Its height, h , in meters, t seconds after the kick is given by the equation $h = -4.9t^2 + 18.24t + 0.8$. The height of an approaching blocker's hands is modeled by the equation $h = -1.43t + 4.26$ using the same time. Can the blocker knock down the punt? If so, at what point will it happen?