Algebra II Name _____

PART 2 – Unit 3 Review

Quadratics Date:_____ Period:_____

Learning Target	Weight	Review Questions	Test Score	Do I Know it?
A2.F-IF.C.7: Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Functions include linear, **quadratic**, exponential, polynomial, logarithmic, rational, sine, cosine, tangent, square root, cube root and piecewise-defined functions. **Embedded standards A2.F-BF.B.3, A2.A-APR.B.3, A2.F-IF.B.4*	3	18 – 24		
A2.A-REI.C.7: Solve a system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. **Embedded standards A2.F-IF.B.6, A2.F-BF.A.1, A2.F-IF.C.7, A2.A-CED.A.1, A2.F-IF.C.9*	2	25 – 28		

A2.F-IF.C.7

18. The parent function $f(x) = x^2$ is vertically stretched by a factor of 2 and translated 7 units right and 3 units up. Fill in the values for a, h and k.

$$y = \_\_\_\_(x - \_\_\_\_)^2 + \_\_\_\_$$

19. The parent function $f(x) = x^2$ is vertically compressed by a factor of ½ and translated 6 units left and 7 units down. Write an equation for the transformed function.

20. Describe the transformations from $f(x) = x^2$ to $g(x) = -(x+1)^2 - 4$.
    - Vertically stretched or compressed by a factor of ___ ?
    - Translated left ___ or right ___ ?
    - Reflected over the *x*-axis?
    - Translated up ___ or down ___ ?

21. Describe the transformations from $f(x) = x^2$ to $k(x) = 4(x-7)^2 + 13$.

22. Three equivalent forms of a quadratic function are given below.

$p(x) = -2x^2 - 12x - 16$

$p(x) = -2(x+2)(x+4)$

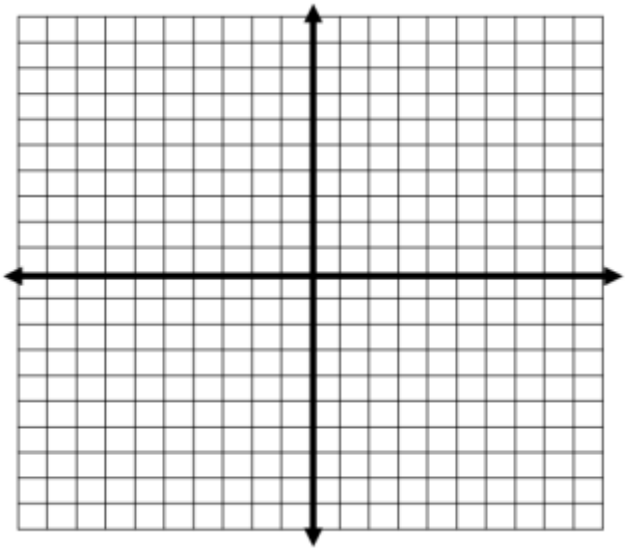
$p(x) = -2(x+3)^2 + 2$

Part A: Which is the vertex form? What is the vertex of the parabola?

Part B: Which is the factored form? What are the *x*-intercepts of the function?

Part C: Which is the standard form?

Part D: Sketch the quadratic, include a minimum of 5 points.



Part E: State the domain and range.

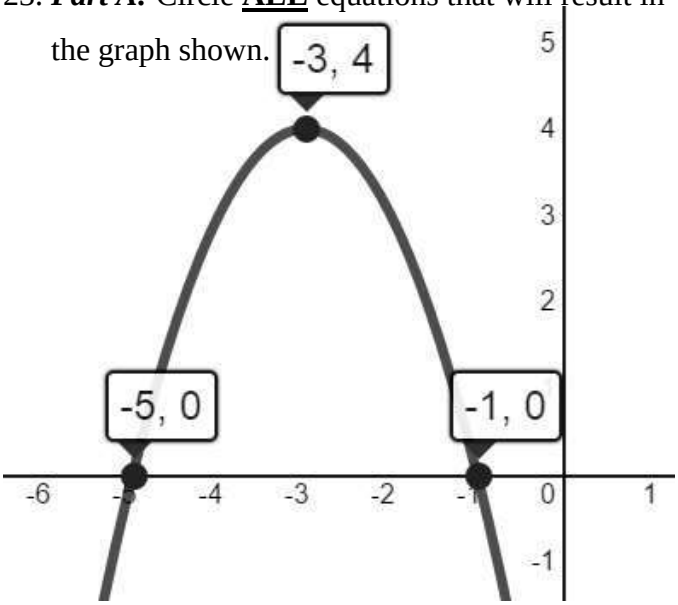
Domain _____ Range _____

Part F: Identify the end behavior of the graph

As $x \to -\infty$, $y \to$ _____

As $x \to \infty$, $y \to$ _____

23. ***Part A:*** Circle **ALL** equations that will result in the graph shown.



A) $y = (x+5)(x+1)$

B) $y = -(x+5)(x+1)$

C) $y = -(x-5)(x-1)$

D) $y = -(x-3)^2 + 4$

E) $y = -(x+3)^2 + 4$

F) $y = (x-3)^2 + 4$

G) $y = -x^2 + 6x + 5$

H) $y = -x^2 - 6x - 5$

I) $y = x^2 + 6x + 5$

Part B: For the graph above identify the following:

List the interval where the function is

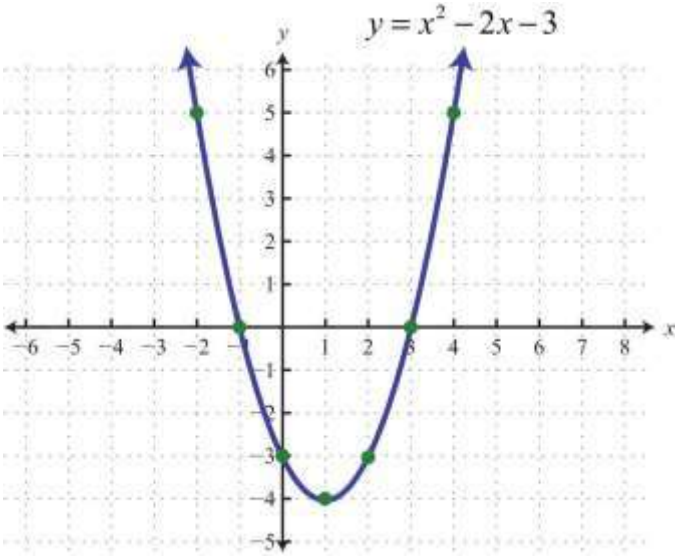
increasing: _____

decreasing: _____

List the interval where $y > 0$: _____

As $x \to \infty$, $y \to$ _____

24. Given the graph, find the following:



List the interval where the function is

increasing: _____

decreasing: _____

List the interval where y < 0: _____

As $x \to \infty$, $f(x) \to$ _____

A2.A-REI.C.7

25. The price of a stock, A(x), over a 12-month period decreased and then increased according to the equation $A(x) = 0.75x^2 - 6x + 20$, where x equals the number of months. The price of another stock, *B(x)*, increased according to the equation $B(x) = 2.75x + 1.50$ over the same 12-month period. Solve the system. Explain your process and what the solution means in context.

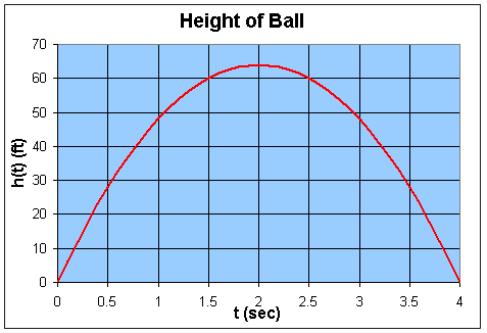
Answer: _____

26. During baseball practice, two players hit baseballs at the same time. The path for each ball is modeled below, where y represents the height of the ball in feet and t represents the time in seconds.

Brett's hit:

$y = -16t^2 + 79t + 6$

Andre's hit:



A)Whose shot goes higher? Justify your answer.

B) Whose shot hits the ground first? Justify your answer.

C) Whose shot travels faster over the interval [0,2]? Justify your answer.

27. The table below gives the fuel economy for a hybrid vehicle at given traveling speeds.

Speed (mi/hr)	Fuel Economy (mi/gal)
15	84.4
25	104.1
30	110.2
35	112.8
40	115.4
45	111.3
50	109
60	100.3
70	91.2

Part A: Calculate a quadratic regression model for the data. Round ***a*** to 3 decimal places; ***b*** and ***c*** to two decimal places.

Part B: According to the regression curve, at what **<u>two</u>** speeds if the fuel economy 105 mi/gal?

Part C: According to the regression curve, what is the maximum fuel economy? At what speed does this maximum occur?

28. The table below gives the costs of running a factory for a full day given the number of video game consoles produced

Consoles Produced	Daily Cost ($1000s)
60	258
70	147
80	87
90	79
100	117
110	207

Part A: Calculate a quadratic regression model for the data. Round to the nearest hundredth.

Part B: According to the regression curve, for what number of video consoles will the daily cost by $100,000?

Part C: According to the regression curve, what is the minimum daily cost? What number of consoles should the factory target?