NAME_____DATE_____

ALGEBRA II WORKSHEET: EXTENSIONS OF QUADRATICS

Complete each example. Show all work on a separate sheet of paper or on the back of this sheet.

1. The profit earned by running a bakery can be modeled by $P = -0.014x^2 + 16.56x - 1345$, where x represents the number of items baked each week and P represents the profit in dollars per week. How many items should the bakery produce each week in order to earn the greatest profit, and what is the maximum profit?

2. The enrollment each year at East Greenwich High School can be modeled by the equation $y = 725 - 17.5x + 1.5x^2$, where x is the time and x = 0 represents 1990. In what year did the high school have its lowest enrollment, and what was the enrollment that year?

3. Bryce Harper hits a popup in the ninth inning against the Red Sox. The equation $y = 4 + 102.5t - 16t^2$ models the height of the ball in feet after t seconds, as y represents the height of the ball in feet. Find the maximum height attained by the ball.

4-5. Graph each inequality on a set of axes. Label any key points.

4. $y > -x^2 + 5x + 14$

5. $y \geq 2(x+3)(x+7)$

6. Convert $y = -4(x+2)(x-3)$ to standard form.

7. Convert $y = x^2 + 14 - 12x$ to vertex form.

8. Convert $y = -9 - x + 3x^2$ to intercept form.

9. Convert $y = -4 + (x+3)^2$ to intercept form.

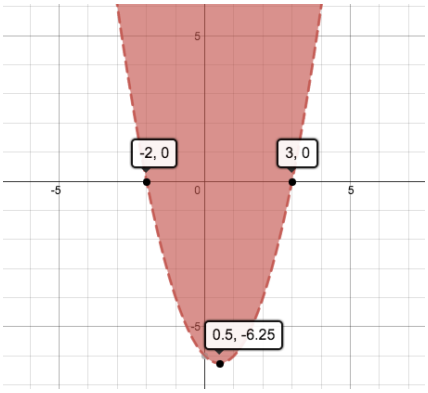
10. The function $y = 4(x+2)^2 + 3$ can not be expressed in intercept form. Why is that so?

11-12. Find the intersection point(s) between the graphs of each system of equations.

11. $y = 3x^2 + 2x - 4$ and $y = 2x^2 + 2x - 5$

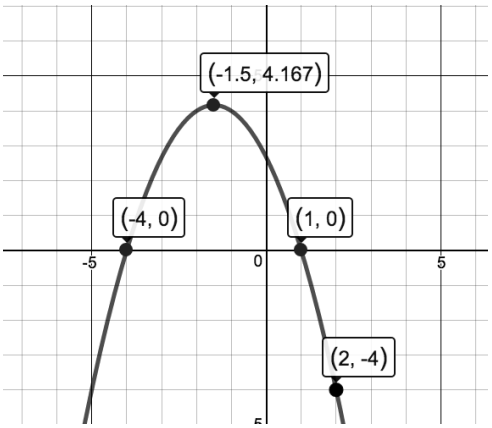
12. $y = x^2 + 4x - 3$ and $y = x^2 - x - 12$

13. Write an inequality that could represent the graph shown.

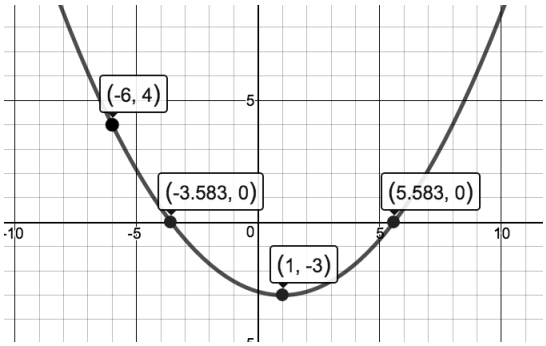


14-15. Find the equation of the function that corresponds to the given graph.

14.



15.



16. Given the quadratic function $y = 2(4x+3)(3x-1)$, find the:

a. x-intercepts

b. y-intercept

c. Zeroes

d. Roots

e. Vertex

f. Range

17. Is the equation in #16 in intercept form? Why or why not?