Name:_____**Date:**_____**Period:**_____
4-1, 4-2, 4-4 Review   **Show all Work!**

A2.F.BF.A.1 Write a function that describes a relationship between two quantities.
A2.F.BF.A.1a Determine an explicit expression, a recursive process, or steps for calculation
from a context.
A2.F.BF.A.1b Combine standard function types using arithmetic operations.

Tier 1 (up to 72 points) Complete #1-9

**Tier 2 (up to 90 points) Complete #1-14 Do not move up to Tier 2 if you have not completed
all of Tier 1.**

**Tier 3 (up to 100 points) Complete #1-17 Do not move up to Tier 3 if you have not
completed all of Tier 1 & Tier 2.**

1. Graph the function $f(x) = -2(x-4)^2 + 3$
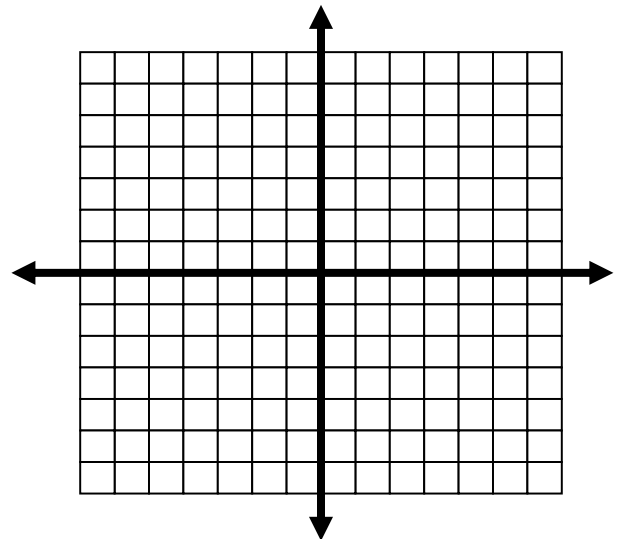   a.   State the axis of symmetry.

    b. State the vertex.

    c. State the maximum or minimum value.
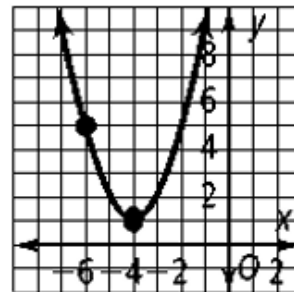
    d. Determine the domain and range.

    e.   Describe how the graph is a transformation of the parent function $f(x) = x^2$

    f.   Convert the parabola to standard form.

2. What is a quadratic function that models the graph?

3. Write the parabola $-2x^2 - 8x + 3$ in vertex form. Then state the vertex.

Factor

4. $y^2 - 8y + 15$

5. $x^2 - 36$

6. $-x^2 + 9x - 18$

7. $3x^2 + 10x + 8$

8. The area of a rectangular field is $x^2 - x - 72$ m². The length of the field is $x + 8$ m. What is the width of the field in meters?

9. Write each parabola in vertex form. State the vertex
    a. $-x^2 + 2x - 5$

    b. $4x^2 - 2x + 1$

10. Graph $y = -x^2 + 6x - 5$
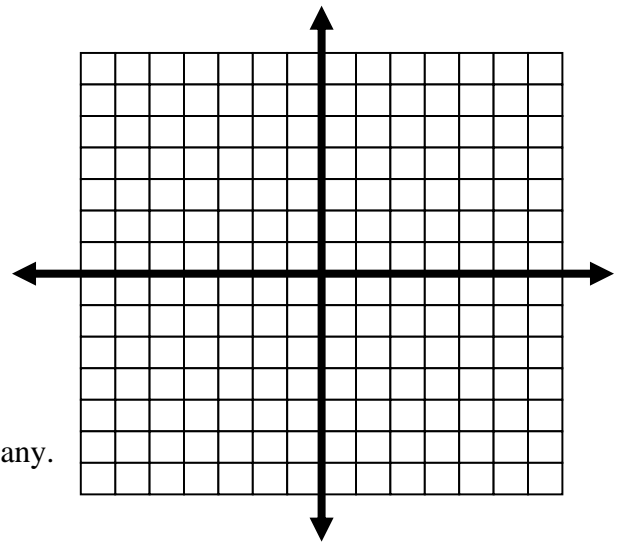   a. State the vertex and axis of symmetry.

    b. Is the vertex a maximum or minimum?

    c. State the maximum or minimum value.

    d. State the x-intercepts & y-intercept(s), if there are any.

    e. State the domain and range.

    f. Convert the quadratic to vertex form.

11. Write an equation for the parabola with vertex (-3, -7) and point (-2, -5).

Factor

12. $5x^2 - 17x + 6$

13. $25x^2 - 100$

14. $3x^2 - 24x + 45$

15. $4x^2 - 8x + 4$

16. A quadratic model for a certain stock on Wall Street is $P = -3d^2 + 50d$, where d represents the days of trading and P is the price per share.
    a. What is the maximum price per share of the stock?

    b. During which day will the stock reach its maximum price? Explain.

17. Layla throws her house key out the window to her brother from their upstairs window several stories above ground. The function $h = -16t^2 + 64$ determines the height h in feet, t seconds after she releases it.
    a. What is the maximum height the key reaches?

    b. After how many seconds does the maximum height occur?

    c. Determine a reasonable domain and range for this situation.

    d. How long does it take for the key to reach the ground?

    e. List 5 characteristics of the graph of this function.