Name: _____

11.5.D1 – THE VERTEX OF QUADRATIC FUNCTIONS

Past due on: _____ Period: _____

Use a graphing calculator to graph the function and determine the x-intercepts. (Use a WINDOW of XMIN = -20, XMAX = 20, YMIN = -10, YMAX = 10.) Then write the quadratic function in factored form. If necessary, factor out a common factor first. *Refer to the 11.4 example "Writing a Quadratic Function in Factored Form" in the Chapter 11 Summary.*

1. $f(x) = x^2 - 8x + 7$

2. $f(x) = 2x^2 - 10x - 48$

3. $f(x) = -x^2 - 20x - 75$

4. $f(x) = x^2 + 8x + 12$

5. $f(x) = -3x^2 - 9x + 12$

6. $f(x) = x^2 - 6x$

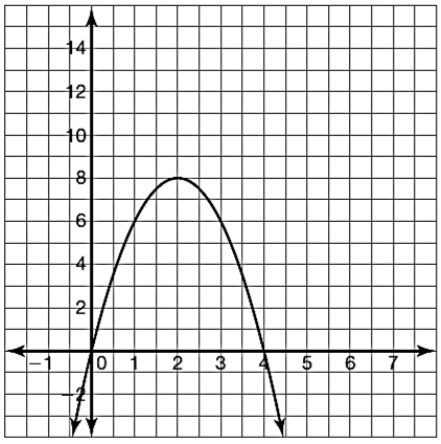
Write a quadratic function in factored form with each set of given characteristics. **Let $a = \pm 3$.** *Refer to the 11.4 example "Writing a Quadratic Function in Factored Form Given its x-Intercepts" in the Chapter 11 Summary.*

7. Opens upward & has x-intercepts $(1, 0)$ & $(-3, 0)$

8. Opens downward & has x-intercepts $(-4, 0)$ & $(28, 0)$

For the function shown, identify the domain, range, vertex, axis of symmetry, y-intercept, zeros, and the intervals of increase and decrease. *Refer to the THREE 11.3 examples "Identifying/Determining Domain & Range/ Zeros/Intervals of Increase & Decrease of a Quadratic Function" in the Chapter 11 Summary.*

8. $f(x) = -2x^2 + 8x$



Domain: _____

Range: _____

Vertex: _____

Axis of symmetry: _____

y-intercept: _____

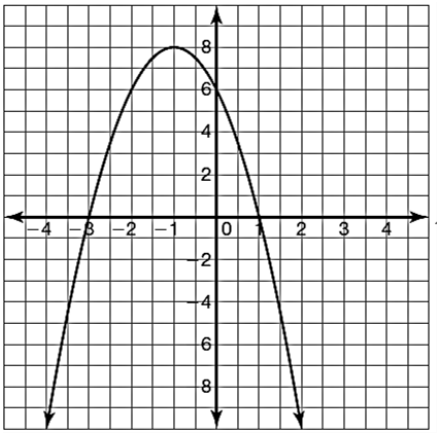
Zeros: _____

Interval of increase: _____

Interval of decrease: _____

Use the zeros to write the factored form of the quadratic function. If necessary, factor out a common factor first.

9. $f(x) = -2x^2 - 4x + 6$



Domain: _____

Range: _____

Vertex: _____

Axis of symmetry: _____

y-intercept: _____

Zeros: _____

Interval of increase: _____

Interval of decrease: _____

Use the zeros to write the factored form of the quadratic function. If necessary, factor out a common factor first.

10. Compare the zeros of the quadratic function in problem 9 and its axis of symmetry. How can you use the zeros to find the axis of symmetry?

1st Semester Spiral Review – *Refer to your 1st semester summary card.*

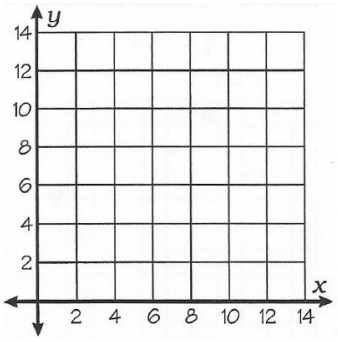
Write a linear inequality in two variables to represent each problem situation. Graph the linear inequality.

11. Zack is buying peanuts and cashews for a party. He can spend no more than \$24. Peanuts cost \$2 per pound and cashews cost \$3 per pound. Let x = peanuts (in pounds) & y = cashews (in pounds).

    a. Write a linear inequality: _____

    b. Graph the linear inequality:

    c. If x = 6 pounds, what are TWO possible values of y?



12. Kara is filling her bathtub. The cold water flows at a rate of 4 gallons per minute. The hot water flows at a rate of 3 gallons per minute. Kara wants no more than 60 gallons of water in the tub. Let x = time that cold water is running & y = time the hot water is running.

    a. Write a linear inequality: _____

    b. Graph the linear inequality:

    c. If x = 3 minutes, what are TWO possible values of y?