Algebra 1 Second Semester Final Exam Review   Name: _____

Solve each quadratic equation. Use each method at least twice (factoring, quadratic formula, complete the square).

1. $x^2 - 8x + 12 = 0$

2. $2x^2 - 24x + 70 = 0$

3. $8x^2 - 15x - 7 = 0$

4. $6x^2 + 13x + 5 = 0$

5. $x^2 + 12x + 32 = 0$

6. $-3x^2 - 24x + 70 = 0$
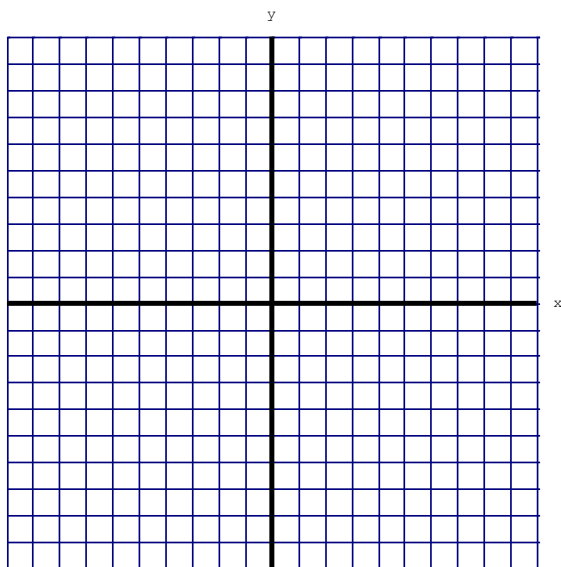
7. $x^2 - 6x - 55 = 0$

8. $12x^2 - 25x - 7 = 0$

9. Simplify: $(-3x^2 - 5x + 2) - (4x^2 - 9x + 6)$

10. Simplify: $(8x^2 - 4x - 5) + (-2x^2 + 7x - 1)$

11. Simplify: $(2x - 7)(3x - 2)$

12. Solve the system by graphing. $y = 4x^2 + 8x - 5$
$$-4x + y = 3$$

13. Solve the system by substitution. $y = 4x^2 + 8x - 5$
$$-4x + y = 3$$

14. Determine what kind of equation the word problem represents: circle your answer.

    DO NOT ANSWER THE QUESTION IN THE WORD PROBLEM

    a. When I bought my motorcycle in 2010, it was worth $22,000. It decreases in value 4% every year. How much is it worth in 2014?

          Linear   Exponential   Quadratic   None

    b. John kicked a field goal with a velocity of 48 feet per second. How long did it take for the ball to come back to the ground?

          Linear   Exponential   Quadratic   None

    c. Julie bought 4 tickets to the John Legend concert for $162.50. Jenny bought 6 tickets for $236.50. How much did each ticket cost? What was the service fee?

          Linear   Exponential   Quadratic   None

15. Jessie climbed a 92 foot cliff, made a wish, and threw her lucky ring into the water below with a velocity of 32 feet per second.

    a. How long did it take the ring to hit the water?

    b. What was the maximum height the ring reached?

16. My parents bought their house in 2007 for $120,000. If it increases in value 2% every year, how much will it be worth in 2015?

17. The number of bacteria at the start of the study was 14. It quadrupled every day. How many were there after 7 days?

18. A taxi driver charges you per mile as well as a set fee for usage of his taxi. Traveling 24 miles will cost you $32.50. A 52 mile trip in the taxi costs $67.50.
    a. How much does the taxi driver charge you per mile?

    b. How much will it cost to travel 100 miles in the taxi?

    c. I got charged $23.75. How far was my trip in the taxi?

19. Tom has been spending an average of $6 per day. On day 12, he has $31 left.
    a. How much money did he have to start with?

    b. How much does he have left on day 17?

    c. On what day did he have $73 left?

20. Find the slope using the given information:
    a. $(12,4)$ $(9,2)$ b. $(7,3)$ $(9,-7)$

21. Find the y-intercept using the given information:

   a. $m = \frac{1}{2}$ $(-4,5)$

   b. $m = -3$ $(-2,-10)$

22. Which type of equation does the following table represent?

-2	-1	0	1	2
7	4	3	4	7

   a. (Circle one): Linear   Exponential   Quadratic

   b. Write an equation to represent the table above: _____

23. Which type of equation does the following table represent?

-2	-1	0	1	2	3
22	17	12	7	2	-3

   a. (Circle one): Linear   Exponential   Quadratic

   b. Write an equation to represent the table above: _____
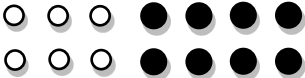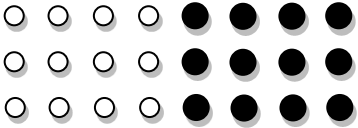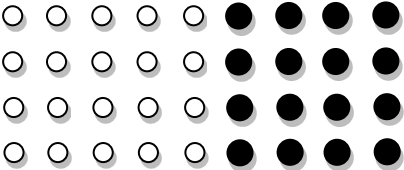
24. Which type of equation does the following table represent?

-2	-1	0	1	2
16	-8	4	-2	1

   a. (Circle one): Linear   Exponential   Quadratic

   b. Write an equation to represent the table above: _____

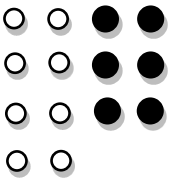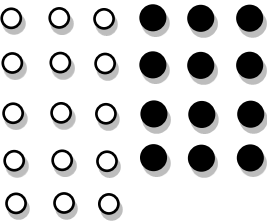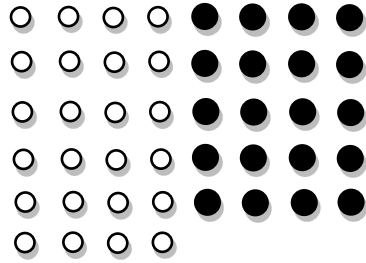25. Answer the questions for the pattern in the table below.

Stage 2	Stage 3	Stage 4

a. Write an expression for the white dots:

b. Write an expression for the black dots:

c. Write an expression for the total dots:

26. Answer the questions for the pattern in the table below.

Stage 2	Stage 3	Stage 4

a. Write an expression for the white dots:

b. Write an expression for the black dots:

c. Write an expression for the total dots:

For #27-32,
a. Circle if each sequence is arithmetic, geometric, quadratic, or none of these.
b. Write a formula for the sequence **if it is arithmetic or geometric**.
c. Find the next three terms in each sequence.

27.   3, 7, 11, 15, 19…   Circle One: A   G   Q   None

                                 Formula (if A or G):

                                 Next 3 terms: _____, _____, _____

28.   7, 14, 28, 56, 112…   Circle One: A   G   Q   None

                                 Formula (if A or G):

                                 Next 3 terms: _____, _____, _____

29.   64, 16, 4, 1…   Circle One: A   G   Q   None

                                 Formula (if A or G):

                                 Next 3 terms: _____, _____, _____

30.   13, 15, 18, 22, 27…   Circle One: A   G   Q   None

                                 Formula (if A or G):

                                 Next 3 terms: _____, _____, _____

31.   5, -3, -11, -19, -27…   Circle One: A   G   Q   None

                                 Formula (if A or G):

                                 Next 3 terms: _____, _____, _____

32.   75, 70, 60, 45, 25…   Circle One: A   G   Q   None

                                 Formula (if A or G):

                                 Next 3 terms: _____, _____, _____

33. Find the vertex, x-intercepts and y-intercept of the following equation, then graph.
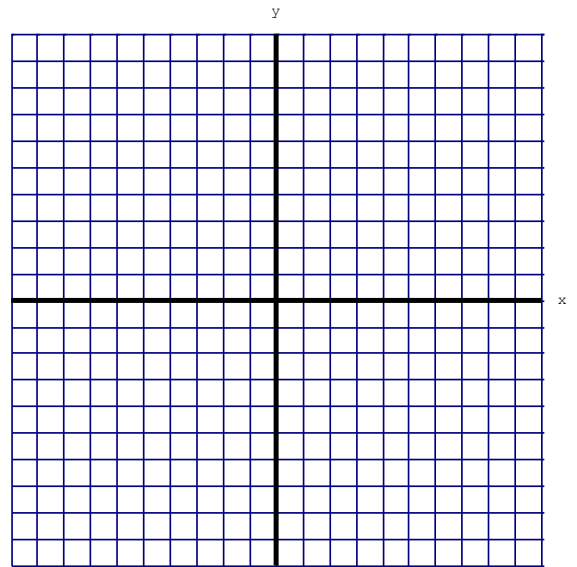
$$y = 3x^2 + 6x + 5$$

x – intercepts (exact): _____ and _____

x-intercepts (approx.): _____ and _____

y-intercept: _____

vertex: _____

34. Solve the system of equations using any method:

$$3x - 2y = -4$$
$$2x + y = -5$$

35. Write the slope intercept equation given the 2 points: $(1, 7)(4, -5)$

36. On Charlotte's first test, she got 54 points. Since joining Ms. Boehl's 8th hour resource, her scores have been increasing by 6%. What was Charlotte's score on her 9th test?