M3 BASIC MATH
LONG TEST BEFORE FINAL EXAM
TOPICS :

- Quadratic Equation in One - variable
  - Solving quadratic equation using factoring method
  - Solving quadratic equation using completing the square
  - Solving quadratic equation using quadratic formula
- Graphing quadratic functions

Part 1: Multiple – Choice (35 items)

1. The polynomial equation $x(x+1)+5=(x-3)(x+3)$ is an example of which type of equation?
   a. Linear equation
   b. Cubic equation
   c. Quadratic equation
   d. Quartic equation

2. Which one is not quadratic functions?
   a. $y=10x^2$
   b. $x^2+y=-2x$
   c. $y=x(x+7)$
   d. $y=4(3x-6)$

For items 3 – 5:

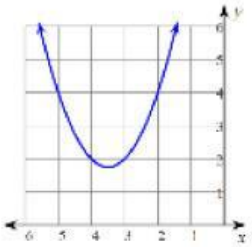
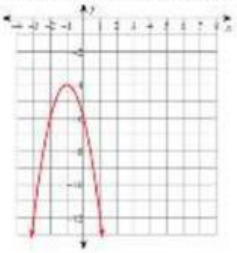
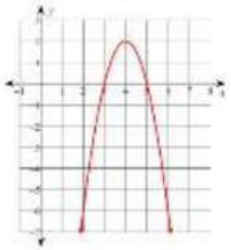
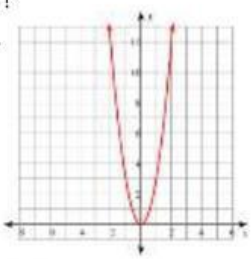
Given a function: $-(y-3)=(x+4)^2$

3. What is the value of a, when the function above is written in the form $y=ax^2+bx+c$?
   a. 1 b. -1 c. -8 d. -13

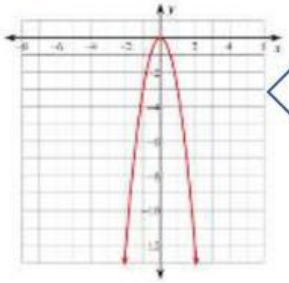
4. What is the value of b, when the function above is written in the form $y=ax^2+bx+c$?
   a. 8 b. -1 c. 13 d. -8

5. What is the value of c, when the function above is written in the form $y=ax^2+bx+c$?
   a. 13 b. -8 c. -13 d. -19

6. When graphed, which of the following functions opens downward?
   a. $y=\left(x-\frac{1}{2}\right)^2+4$
   b. $y=-x^2+5x-7$
   c. $y=x^2-5x+10$
   d. $y=2(x-\frac{1}{2})^2-1$

7. Which of the following graphs represents a quadratic function with two real roots?
   a. 
   b. 
   c. 
   d. 

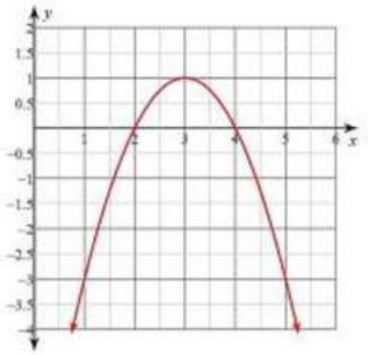
8. How many real roots does the quadratic function on the right have?
   a. none
   b. one
   c. two
   d. three



9. What statement(s) about the function: $y=2x^2$ is/are true?
   i. The graph of the parabola opens upward.
   ii. The axis of symmetry is $x=0$.
   iii. The vertex is at $(0,0)$.
   iv. The maximum value is $y=0$.
   a. i,ii,iii, and iv b. i,ii and iii c. i and iii d. i and ii

LIVEWORKSHEETS

For items 10 – 13, refer to the graph on the right.



10. What is the vertex of the parabola on the right?
    a. (2, 0) b. (4, 0) c. (1 , 3) d. (3, 1)

11. Which of the following is true about the value of the function above?
    a. The minimum value of y is 3. b. The maximum value of y is 3.
    c. The minimum value of y is 1. d. The maximum value of y is 1.

12. What is the axis of symmetry of the parabola above?
    a. $x = 3$ b. $x = 4$ c. $x = 2$ d. $x = 1$

13. What are the real roots of the function graphed above?
    a. ± 2 b. ± 4 c. 2 and 4 d. 3

For items 14 – 17, refer to the statement below.

A quadratic function in vertex form is written as: $y = a(x-h)^2 + k$, where (h, k) is the vertex, and $x = h$ is its axis of symmetry.

14. Which of the following is the vertex form of the function: $y = -x^2 + 6x - 10$?
    a. $y = -(x-3)^2 + 1$ b. $y = (x-3)^2 - 1$
    c. $y = -(x-3)^2 - 1$ d. $y = -(x+3)^2 - 1$

15. Using the function in item 14, what is its axis of symmetry?
    a. $x = -3$ b. $x = 3$ c. $x = 1$ d. $x = -1$

16. From the given quadratic function in item 14, what is its vertex?
    a. $(3, -1)$ b. $(-3, -1)$ c. $(3, 1)$ d. $(-3, 1)$

17. Using the same given function in item 14, what is the opening of the parabola?
    a. upward b. downward c. opens to the left d. opens to the right

18. Which represents the quadratic function: $y = -2(x-2)^2 + 4$ in standard form?
    a. $y = -2x^2 + 8x - 4$ b. $y = -2x^2 - 8x + 4$
    c. $y = -2x^2 + 16x - 12$ d. $y = -2x^2 - 16x - 12$

For items 19 – 20:

Use the function: $y = 2x^2 + 4x + 5$

19. What is the vertex of the parabola?
    a. (1, -3) b. (3, -1) c. (-1, 3) d. (1, 3)

20. What is the axis of symmetry of the parabola above?
    a. $x = -1$ b. $x = 3$ c. $x = 1$ d. $y = -3$

21. Rewrite the quadratic function $y = x^2 - 4x + 3$ in vertex form.
    a. $y = (x-4)^2 + 3$ b. $y = (x-2)^2 + 3$
    c. $y = (x-4)^2 - 1$ d. $y = (x-2)^2 - 1$

22. Tell whether the graph of the function $y = -3x^2 + 12x - 8$ opens upward or downward and why?
    a. The parabola opens upward because $a > 0$.
    b. The parabola opens downward because $a > 0$.
    c. The parabola opens upward because $a < 0$.
    d. The parabola opens downward because $a < 0$.

LIVEWORKSHEETS

23. Which of the following can be used to find the axis of symmetry of a quadratic function?

a. $b^2 - 4ac$ b. $\frac{-b}{2a}$ c. $\frac{b}{2a}$ d. $b - 4ac$

24. Find the axis of symmetry of the graph of $y = x^2 - 8x + 14$.

a. $x = -2$ b. $x = 4$ c. $y = 4$ d. $y = -2$

25. Find the vertex of the graph of f(x) = = x^2 - 6x +11

a. (-3, 2) b. (3, 2) c. (3, -2) d. (2, 3)

Part 2 (Send a photo of your answer to my personal line chat)

2.1 Rewrite the function from standard into vertex form : y = a(x-h) ^{2} + k and determine the following information and graph.

$$y = -x^2 + 4x - 8$$

a. Vertex form : _____

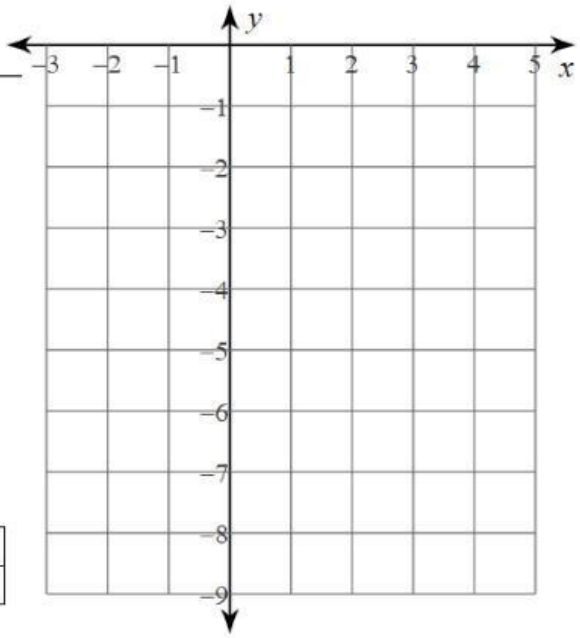
b. Vertex: _____

c. y – intercept: _____

d. Graph opens : _____

e. Equation of axis of symmetry:_____

f. Number of real roots: _____



Complete the table of values: $y = -x^2 + 4x - 8$

X	-4	-3	-2	-1	0
y					

LIVEWORKSHEETS