

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

c. Quadratic equation

b. Cubic equation

d. Quartic equation
2. Which one is not quadratic functions?

a. $y = 10x^2$

c. $y = x(x + 7)$

b. $x^2 + y = -2x$

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?

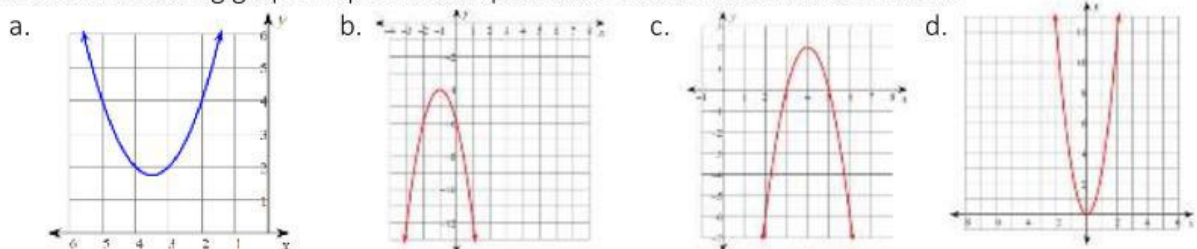
a. $y = \left(x - \frac{1}{2}\right)^2 + 4$

c. $y = x^2 - 5x + 10$

b. $y = -x^2 + 5x - 7$

d. $y = 2\left(x - \frac{1}{2}\right)^2 - 1$

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



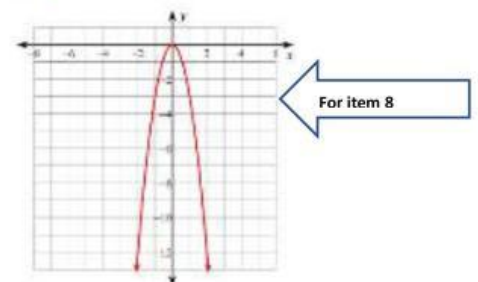
8. How many real roots does the quadratic function on the right have?

- a. none

c. two

b. one

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

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?

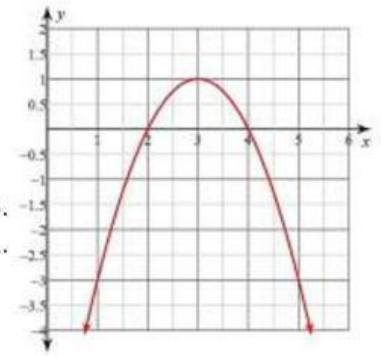
- a. The minimum value of y is 3. b. The maximum value of y is 3.
c. The minimum value of y is 1. d. The maximum value of y is 1.

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 $a < 0$.

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					

