Multiple Choice

1. Identify a, b, and c for the quadratic $2x^2 - 19x = 10$
   a. $a = 2$, $b = -19$, $c = 10$
   b. $a = 2$, $b = -19$, $c = -10$

2. Describe how the graph of $y = 2x^2 - 4$ has been translated from (0,0).
   a. up 4
   b. down 4
   c. right 4
   d. left 4

3. What are the coordinates for the vertex for the quadratic $y = x^2 - 6x + 11$?
   a. (2, 3)
   b. (3, 2)
   c. (-3, 2)
   d. (3, -2)

4. Which quadratic is wider, $f(x) = \frac{1}{4}x^2 + 3$ or $g(x) = -5x^2$?
   a. $f(x)$
   b. $g(x)$
   c. no difference
   d. do I have another choice?

For #5 - 7, use the graph at the right.

5. What is the axis of symmetry?
   a. $x = 2$
   b. $x = 1$
   c. $x = -2$
   d. $x = -1$

6. What are the solutions to the graph?
   a. -3 or -1
   b. -2 or 3
   c. 1 or 3
   d. -2

7. What point is the y-intercept?
   What point is its reflection?

   Use one of the points in #5 and the solutions from #6 to write the equation.
Give the best answer for the following.

8. How many possible solutions can a quadratic have?
   a. two         b. one         c. none         d. all of these

9. Which of the following graphs has no solution.
   a. 
   b. 
   c. 
   d. 

10. Which of the following functions have maximums. (More than one answer!!)
    a. \( f(x) = x^2 \)      b. \( g(x) = -x^2 + 1 \)      c. \( h(x) = x^2 - 9x \)      d. \( j(x) = -16x^2 + 10x \)

Solve by Factoring,

11. \( x^2 - 6x + 8 = 0 \)

12. \( 2x^2 - 4x = 0 \)

13. \( x^2 + 7x = 0 \)

14. \( 2x^2 + x - 1 = 0 \)
Solve using the Quadratic Formula. Write answers as a simplified radical when needed.

\[ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \]

15. \( x^2 - 5x = 12 \)

16. \(-4x^2 - 9x + 5 = 0\)

Solve using the Square Root Property. Write answers as a simplified radical when needed.

17. \( 16x^2 - 9 = 0 \)

18. \((x - 10)^2 + 4 = 0\)

19. \((x - 10)^2 - 6 = 0\)

Solve by Completing the Square.

20. \( x^2 + 8x - 3 = 0 \)

21. \( 2x^2 - 12x + 4 = 0 \)
The following quadratics are written in vertex form. State the axis of symmetry and vertex for each. Identify which quadratic has no solution.

22. \( y = (x - 6)^2 - 12 \)  

23. \( y = -2(x + 8)^2 + 5 \)

Change the following quadratics to vertex form.

24. \( y = x^2 - 4x - 7 \)  

25. \( y = 2x^2 + 4x + 8 \)

For #26, graph the following quadratics. Factor to find the zeros. Plot 5 points.

26. \( y = 2x^2 - 2x - 4 \)

Axis of Symmetry: _________  

Vertex: (______, ____ )  

Direction: _________  

Zeros:  

y-intercept:  

point symmetric to y-intercept: (______, ____ )  

Factor to find the zeros.
For #27, graph the following quadratics. **Factor to find the zeros. Plot 5 points.**

27. \( y = -x^2 + 7x - 10 \)

Axis of Symmetry: 

Vertex: (_____, ____)

Direction: 

Zeros: 

\( y \)-intercept: 

point symmetric to \( y \)-intercept: (_____, ____)

**Factor to find the zeros.**

28. The area of a rectangle is 112 ft\(^2\). The length is 2 less than twice the width. Find the dimensions of the rectangle. Hint: write the equation, then find the zeros or solutions.
29. For each quadratic below, find the discriminant $b^2 - 4ac$. Based on the answer to each discriminant, how many solutions will each quadratic have? One, two or none? Show work.

a. $x^2 - 10x + 25$

b. $x^2 - 10x - 25$

c. $-2x^2 - 10x - 25$

30. A ball is hit straight upward from the top of a cliff that is 80 feet high. The initial velocity of the ball is 64 feet per second. To represent this mathematically, use the quadratic equation $f(t) = -16t^2 + 64t + 80$, where $t$ is the time in seconds. Show work below.

a. Find the maximum height and the time in seconds when it is attained. Write a sentence using the information found. (Hint: find the vertex).

b. What is the total time the ball is in the air? Write a sentence using the information found (Hint: find zeros)

Show work here: