Name: Date: Hour:

Algebra 1
Unit 9 Test Review

I. Determine if the given function is quadratic.

1. $y + 6x = -14$

2. $2x^2 + y = 3x - 1$

3.

x	−4	−3	−2	−1	0
y	39	18	3	−6	−9

4. $\{(-10, 15), (-9, 17), (-8, 19), (-7, 21), (-6, 23)\}$

5.

x	−2	−1	0	1	2
y	−1	0	4	9	15

6. $\{(0, -3), (1, -2), (2, 1), (3, 6), (4, 13)\}$

II. Graphing

#7-9. Answer the following questions for each given function. (Show your work to the right)

7. $y = -5x^2 + 10x + 3$

a. Find the vertex : _____

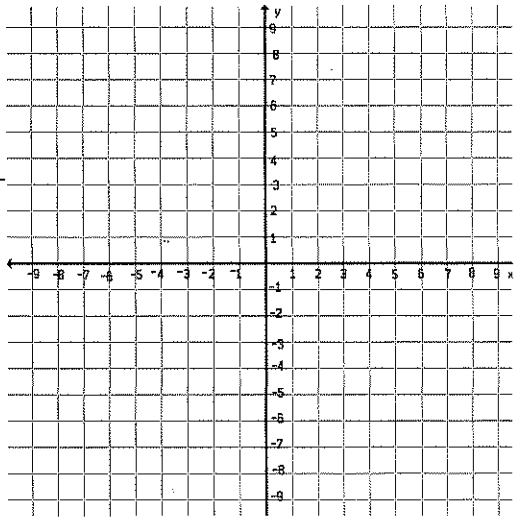
b. Find the y-intercept (ordered pair): _____

c. Does it open up or down? _____

d. Is the vertex a maximum or a minimum? _____

e. Is the graph Normal, Narrow or wide? _____

f. Give the domain and range: _____



8. $y = \frac{1}{2}x^2 + 2x$

a. Find the vertex : _____

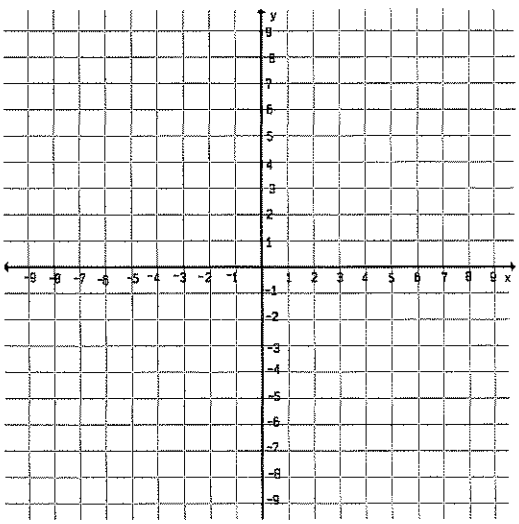
b. Find the y-intercept: _____

c. Does it open up or down? _____

d. Is the vertex a maximum or a minimum? _____

e. Is the graph Normal, Narrow or wide? _____

f. Give the domain and range: _____



9. $y = -x^2 + 6x + 1$

a. Find the vertex : _____

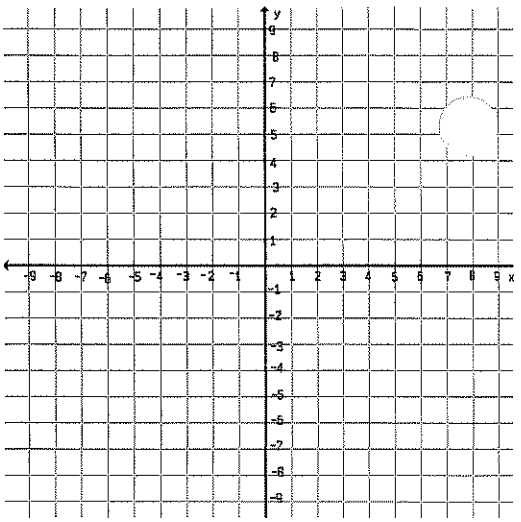
b. Find the y-intercept: _____

c. Does it open up or down? _____

d. Is the vertex a maximum or a minimum? _____

e. Is the graph Normal, Narrow or wide? _____

f. Give the domain and range: _____



III. Comparing Graphs of Quadratics

Using the description of the transformation, write a quadratic equation in vertex form.

10. Shifted left 8 and down 4, opening down, vertically compressed

11. Opening up, vertex at (2, -5), narrow

12. Reflected, normal, shifted right 3 and up 10

#13-16. Describe the difference between each graph and the parent function $y = x^2$.

13. $y = \frac{1}{3}(x-2)^2 + 5$

14. $g(x) = x^2 + 6$

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

16. $y = -\frac{7}{4}(x+1)^2 + 6$

17. You graphed the function $f(x) = x^2 - 4$, and I graphed the function $f(x) = x^2 + 3$. How is my graph going to look compared to yours?

18. Put the graphs in order from narrowest to widest.

$$f(x) = x^2, g(x) = -\frac{4}{5}x^2, \quad h(x) = 3x^2$$

IV. Factoring and solving by factoring.

#19-24. Solve the equations.

19. $5x^2 - 15 = -10x$

20. $4x^2 = 16x$

21. $3x^2 + 9x = 12$

22. $6x^2 = 6$

23. $6x^2 + 23x = 4$

24. $-3x^2 + 27 = 0$

V. Application Problems

#25 – 31. Follow the directions for each question.

25. The height in feet that a football is kicked can be modeled by the function $f(x) = -16x^2 + 64x$. What is the maximum height the football will reach?

26. As Molly dives into her pool, her height above the water can be modeled by the function $f(x) = -16x^2 + 72x$, where x is the time in seconds after she begins diving. How long does it take Molly to reach the pool?

27. An Olympic diver's height can be modeled by the function $f(x) = -3x^2 + 6x + 24$, where x is the time in seconds after he begins the dive. How long does it take the diver to hit the water?

28. The height of a volleyball after being hit can be modeled by the equation $f(x) = -4.9x^2 + 9x + 5$, where x is the time in seconds after the hit. If the other team jumps up and gets their hands 8 feet in the air, will the ball make it over their hands?

29. Tanisha kicks soccer ball during a game. The height of the ball in feet can be modeled by the function $f(x) = -16x^2 + 48x$, where x is the time in seconds. What is the height of the ball after 2 seconds?

30. The height of a flare can be approximated by the function $h = -16t^2 + 95t + 6$, where h is the height in feet and t is the time in seconds. Find the height of the flare after 4 seconds.

31. A water balloon is dropped from a window at a height of 144 feet. This can be modeled by the function $h(t) = -16t^2 + 144$. What is the height of the balloon after 2 seconds?