Name: _____

Final Review

1. Simplify: $(8x^3y^4)^2$

2. What is the distance formula?

3. Rewrite using only positive exponents and evaluate the result.

$$5^{-3} =$$

$$\frac{1}{2^{-4}} =$$

4. Simplify: $\frac{5x+5}{15x+15}$

5. Simplify: $\frac{4x}{9}+\frac{x}{6}$

6. Simplify: $\frac{x^{\frac{1}{10}}x^{\frac{4}{5}}}{x^{\frac{3}{10}}}$

7. Simplify: $\sqrt{45}$

8. Simplify: $\sqrt{72}$

9. Write an expression equivalent to the expression below.

$$(2x^3-5x^2+x)+(-3x-7+x^2)$$

10. Subtract: $(2x^2+11x+8)-(-8x^2+x-2)$

11. Simplify: $\frac{3x^3+12x^2-6x}{3x}$

12. Which is the factored form of $8x^2-10x-3$?

13. Find the product of $(x+9)(x-2)$.

14. A swimming pool is shaped like a rectangle. It has a width of $5x-1$ meters and a length of $x+2$ meters.

    a. Draw a picture.

    b. Find the perimeter of the pool.

    c. Find the area of the pool.

15. Write an expression equivalent to $(x+5)^2$.

16. If $x+4$ is a factor of $x^2+bx+20$, what is the value of b?

17. Factor $10x^5-13x^4-3x^3$ completely.

18. What are the solutions to the equation $5x+1=3x^2$?

19. What are the x-intercepts of the equation $5x^2-45=0$?

20. The following equation describes the height (h) of a ball seconds (t) after the ball was kicked.

$h=-8t^2+12t$

How long will it take for the ball to hit the ground?

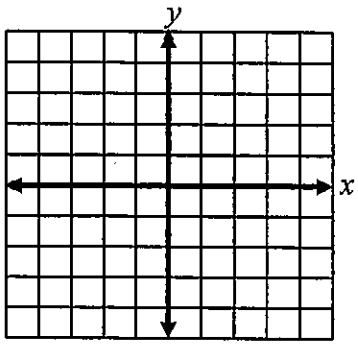
21. Write an equation whose solution is the time it takes for a 5 foot tall boy to throw a ball at a velocity of 12 feet per second to rise 60 feet? Use the formula: $h(t)=-16t^2+12t+60$.

22. Solve the equations.

a. $0=(x-2)(x+9)$ *b.* $0=(x+6)(x-\frac{3}{2})$

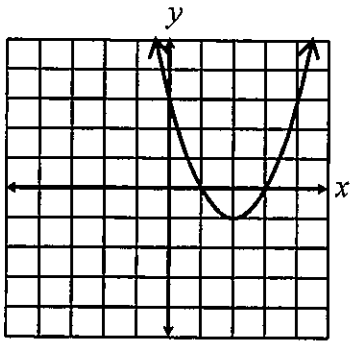
23. Find the solution(s) to $(3x-1)^2=25$

24. Graph $f(x)=x^2-2$?



25. Which ordered pair is the y-intercept of $f(x)=-2x^2+8x+6$?

26. Given the parabola find the ...



Vertex: _____

y-intercept: _____

x – intercepts: _____
and _____

Vertex form: _____

Intercept form: _____

Standard form: _____

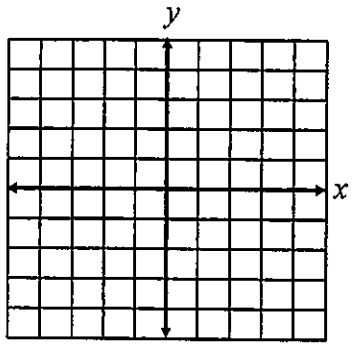
27. Rewrite the following equation in vertex form and state the vertex.

a. $y = x^2 + 6x + 15$

b. $y = x^2 - 10x - 30$

28. Find the axis of symmetry for the following function $f(x) = 3x^2 + 8x + 1$.

29. Graph $y = x^2 - 3x - 4$ and fill in the blanks below.



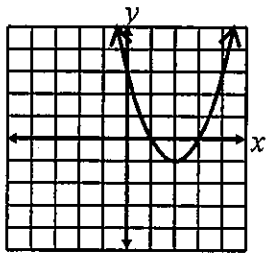
y-intercept: _____

x – intercepts: _____ and _____

Maximum or Minimum?

30. How many roots does each quadratic have?

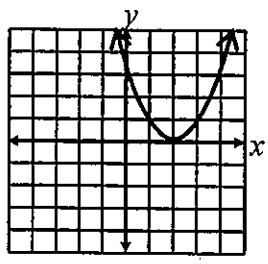
a.



Number of real roots

_____

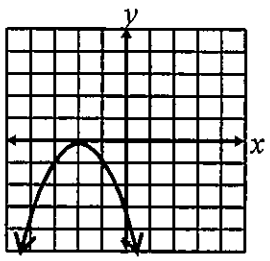
b.



Number of real roots

_____

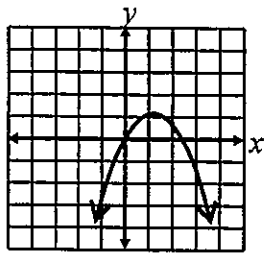
c.



Number of real roots

_____

d.



Number of real roots

_____

e. $y = 4x^2 + 4x + 1$ Number of real roots _____

f. $y = 5x^2 - 2x + 1$ Number of real roots _____

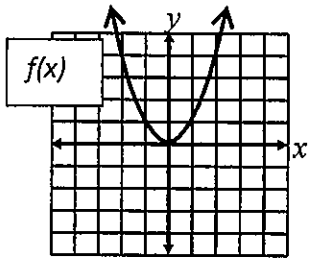
f. $y = 8x^2 + 3x - 1$ Number of real roots _____

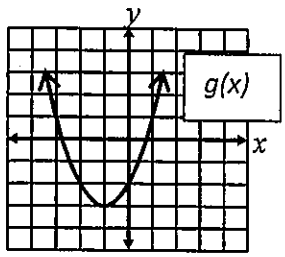
31. Find the vertex and then determine if it is a maximum or minimum point.

$y = -x^2 + 12x + 5$

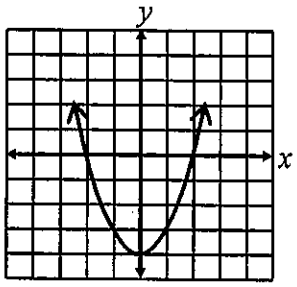
Vertex: _____ Maximum or Minimum: _____

32. Given the *f(x)* function (left), write a transformation of *f(x)* that results in the curve *g(x)* (left).





33. Given the function below, determine the



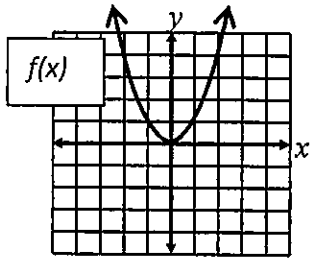
Vertex: _____

Maximum or Minimum: _____

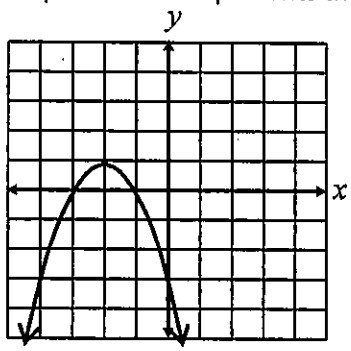
Domain : _____

Range: _____

34. If *f(x)* is shifted 3 units to the right and 5 units down, identify an equation that would represent the translated function?



35. Write an equation that represents the graph?

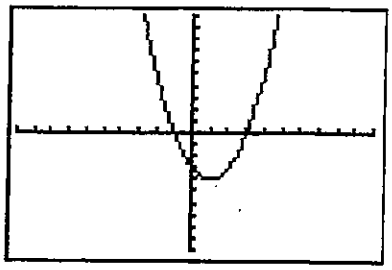


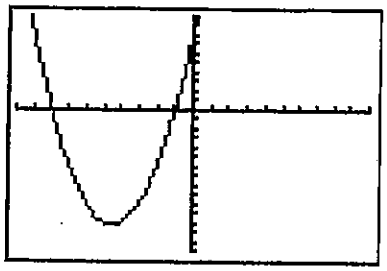
Equation: _____

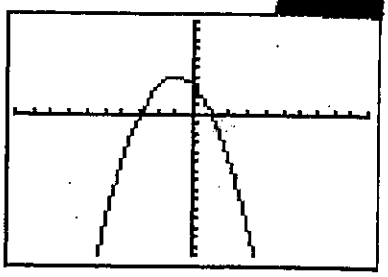
What Equation Am I?

Name_____

On the line below each graph write a **possible** equation that could produce the graph.
Use your knowledge of roots of equations and shapes of parabolas to make your decisions.

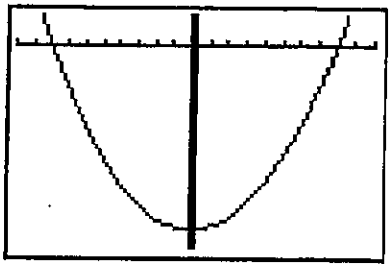


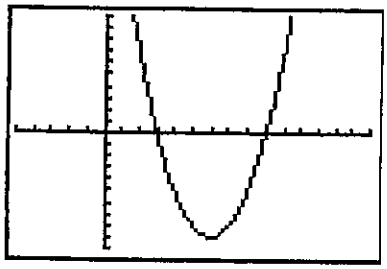


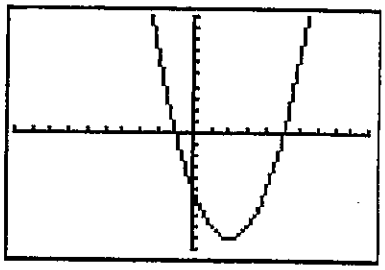


VERTEX FORM _____ _____ _____

INTERCEPT FORM

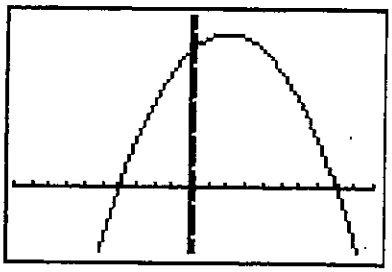


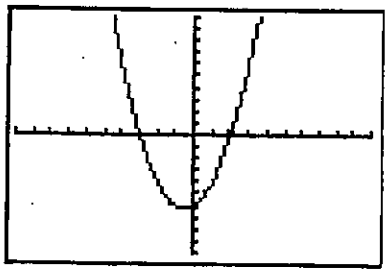


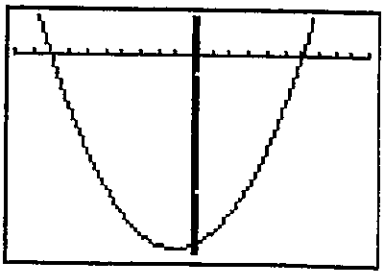


INTERCEPT FORM _____ _____ _____

STANDARD FORM







VERTEX FORM _____ _____ _____

STANDARD FORM

1. ***Multiple Choice*** The graph of $y = ax^2 + bx + c$ is a parabola whose vertex has an x-coordinate of ___?___.

(A) $-\frac{2a}{b}$ (B) $\frac{b}{2a}$ (C) $-\frac{a}{2b}$

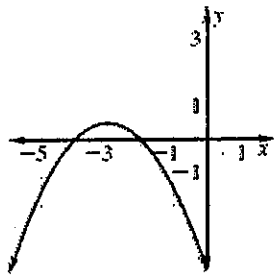
(D) $-\frac{b}{2a}$ (E) $\frac{a}{2b}$

5. ***Multiple Choice*** What is the y-coordinate of the vertex for the graph of the equation $y = -2x^2 + x - 5$?

(A) $-\frac{1}{4}$ (B) $-6\frac{1}{4}$ (C) $4\frac{1}{4}$

(D) $5\frac{1}{4}$ (E) $-4\frac{7}{8}$

7. ***Multiple Choice*** Which of the following quadratic equations is represented by the graph?



(A) $y = -2x^2 - 3x - 4$

(B) $y = \frac{1}{2}x^2 - 3x - 4$

(C) $y = 2x^2 - 3x - 4$

(D) $y = -\frac{1}{2}x^2 - 3x - 4$

(E) $y = \frac{1}{2}x^2 + 3x - 4$

8. ***Multiple Choice*** An eagle circling a field at a height of 250 feet sees a rabbit below. The eagle dives at an initial speed of 110 feet per second. Estimate the time the rabbit has to escape.

(A) 1.7 sec (B) 1.8 sec

(C) 1.6 sec (D) 1.9 sec

(E) 2.0 sec

1. ***Multiple Choice*** Use the graph to determine the roots of the equation.

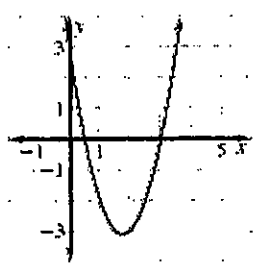
(A) 3 and −3

(B) 1 and 4

(C) $-\frac{1}{2}$ and 3

(D) $\frac{1}{2}$ and 3

(E) 4 and −3



2. ***Multiple Choice*** What are the x-intercepts of the graph of $y = x^2 - 3x - 18$?

(A) 6 and −3 (B) −6 and 3

(C) 9 and 2 (D) −9 and 2

(E) 4 and 1

10. ***Multiple Choice*** Choose the equation of the parabola shown in the graph below.

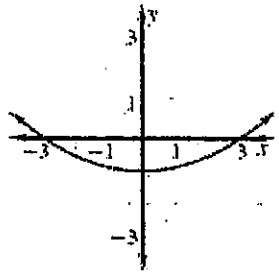
(A) $y = 9x^2 - 1$

(B) $y = 9x^2 + 1$

(C) $y = \frac{1}{9}x^2 - 9$

(D) $y = 9x^2 + 1$

(E) $y = \frac{1}{9}x^2 - 1$



1. ***Multiple Choice*** Choose the correct form of the quadratic formula.

(A) $x = \frac{b \pm \sqrt{b^2 + 4ac}}{2a}$

(B) $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

(C) $x = \frac{-a \pm \sqrt{a^2 - 4bc}}{2a}$

(D) $x = \frac{-c \pm \sqrt{b^2 - 4ac}}{2b}$

(E) $x = \frac{-b \pm \sqrt{a^2 - 4bc}}{2a}$

2. ***Multiple Choice*** What is the discriminant of the equation $-3x^2 - 12x + 17 = 8$?

(A) 36 (B) 348 (C) −348

(D) −252 (E) 252

3. ***Multiple Choice*** Use the discriminant to determine the number of solutions for the equation $3x^2 - 7x - 1 = 0$?

(A) 3 (B) 1 (C) 2

(D) Infinitely many (E) None

4. ***Multiple Choice*** Use the discriminant to determine the number of solutions for the equation $\frac{1}{2}x^2 = 8$.

(A) 3 (B) 1 (C) 2

(D) Infinitely many (E) None

1. ***Multiple Choice*** What is the vertex of the graph of $y = \frac{1}{4}(x - 2)^2 + 6$?

Ⓐ $(0, 7)$ Ⓑ $(2, 6)$

Ⓒ $(-2, -6)$ Ⓓ $(4, 7)$

Ⓔ $(-2, 6)$

3. ***Multiple Choice*** What is the vertex of the graph of $y = 3x^2 - 12x + 13$?

Ⓐ $(-2, 1)$ Ⓑ $(2, 1)$

Ⓒ $(-2, -1)$ Ⓓ $(0, 13)$

Ⓔ $(2, -1)$

5. ***Multi-Step Problem*** A golf ball is hit from ground level into the air following the path of the equation $y = -0.1x^2 + 10x$. (Assume the x-axis is ground level.)

c. At what point did the golf ball reach its maximum height?

d. What was the maximum height of the golf ball in terms of yards?

Write the quadratic function in standard form. Determine whether the graph of the function opens up or down.

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

2. $y = 3x + 3x^2 - 4$

3. $y = -5 - 4x^2$

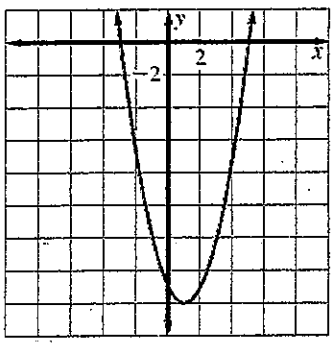
Match the quadratic function with its graph.

22. $y = x^2 + 2x - 15$

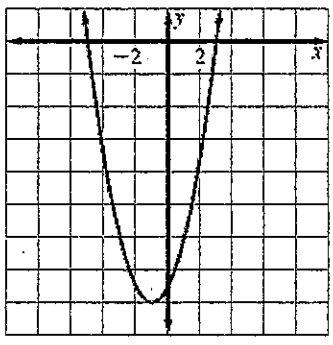
23. $y = (x + 3)(x - 5)$

24. $y = -(x + 1)^2 - 12$

A.



B.



C.