

Home: 22Date: 2/3

p278 #13-25 odd, 27-32 all, 33-40 all

<http://www.mathvizza.com>Bell WorkDirections: Please expand the following.

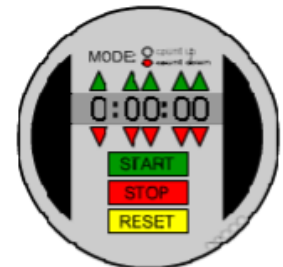
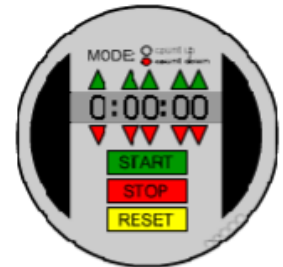
1.  $(2x-9)(3x+8)$

2.  $(3x-9)^2(3x-9)$        $9x^2 - 54x + 81$

Directions: Please simplify the following.

$$-(3x+9)-(4x+9)+(5x+8)$$

$$\begin{aligned} & -3x-9-4x-9+5x+8 \\ & -2x-10 \end{aligned}$$



$$6x^2 - 11x - 72 \quad (3x+8)(2x-9)$$

$6x^2$	$-72$	$-11x$	
<del><math>3x</math></del>	<del><math>-8-9</math></del>	<del><math>-24x</math></del>	$-57x$
<del><math>2x</math></del>	<del><math>98</math></del>	$18x$	$+16x$

### Objectives

1. The students will write **quadratic functions** in standard form.
2. The students will determine if a function is a **quadratic function**.
3. The students will determine if the graph of quadratic function opens up or down.
4. The students will determine if the y-coordinate of the vertex of a function is a **maximum** or a **minimum**.

Vocabulary

quadratic function - a function of the form

$$f(x) = ax^2 + bx + c$$

*red flag*

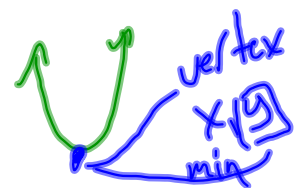
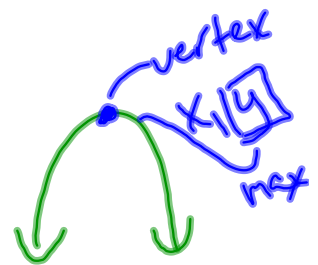
parabola - the graph of a quadratic function



vertex - the highest or lowest point on parabola

maximum - the largest y value of a function

minimum - the smallest y value of a function



### Writing Quadratic Functions in Standard Form

Directions: Please write the following quadratic functions in standard form and identify a, b & c.

Example 1  $\rightarrow y = ax^2 + bx + c$   $a = \underline{3}$

$$f(x) = 3(x-4)(x+1)$$

$$= (3x - 12)(x + 1)$$

$$= 3x^2 + 3x - 12x - 12$$

$$b = \underline{-9}$$

$$c = \underline{-12}$$

Flash Cards

Example 2  $= 3x^2 - 9x - 12$   $a = \underline{-2}$

$$b(x) = -(x-5)(2x+1)$$

$$-(2x^2 + x - 10x - 5)$$

$$-2x^2 - x + 10x + 5$$

$$-2x^2 + 9x + 5$$

$$b = \underline{9}$$

$$c = \underline{5}$$

Determining if a Function is Quadratic

Directions: Please determine which of the following functions is quadratic.

1.  $m(x) = \frac{2x^2 - 4x + 1}{3x + 2}$  *no*

2.  $m(r) = 2 + r^1$  *linear* *no*

3.  $b(z) = 2 - 4z^2$  *yes*

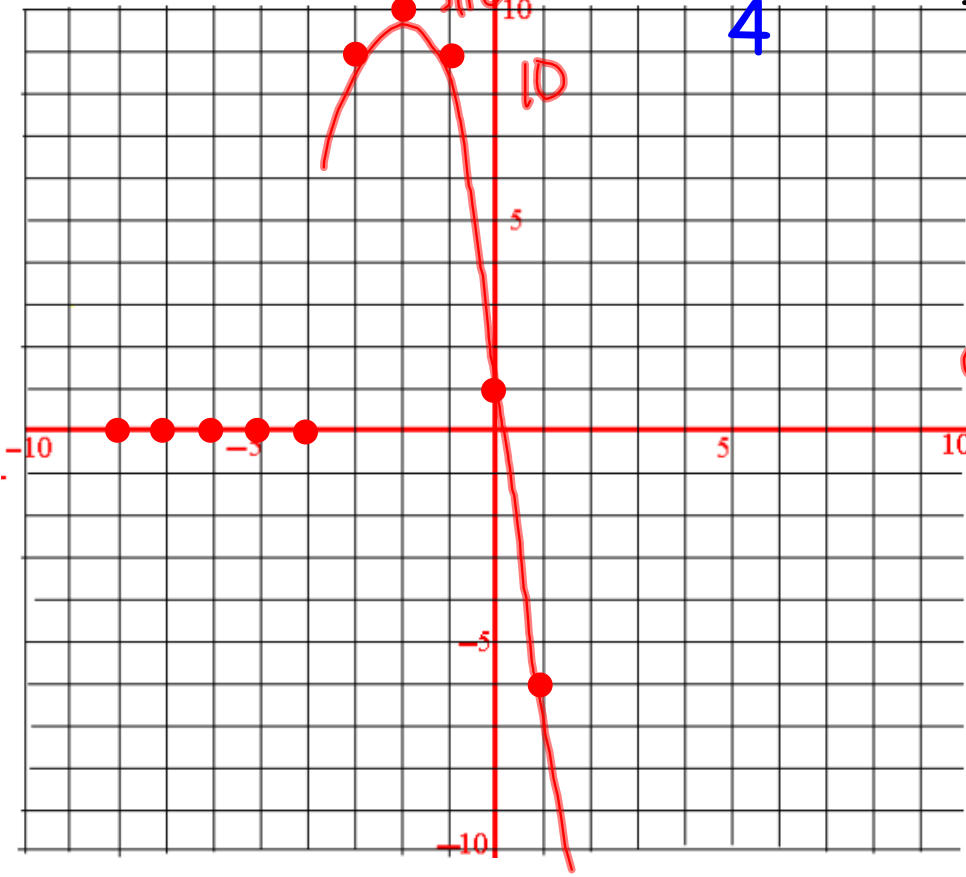
4.  $p(x) = \overbrace{x^2(x-4)}$   
 $x^3 - 4x^2$

5.  $h(x) = -2x - \frac{2}{3}x^2$  *yes*

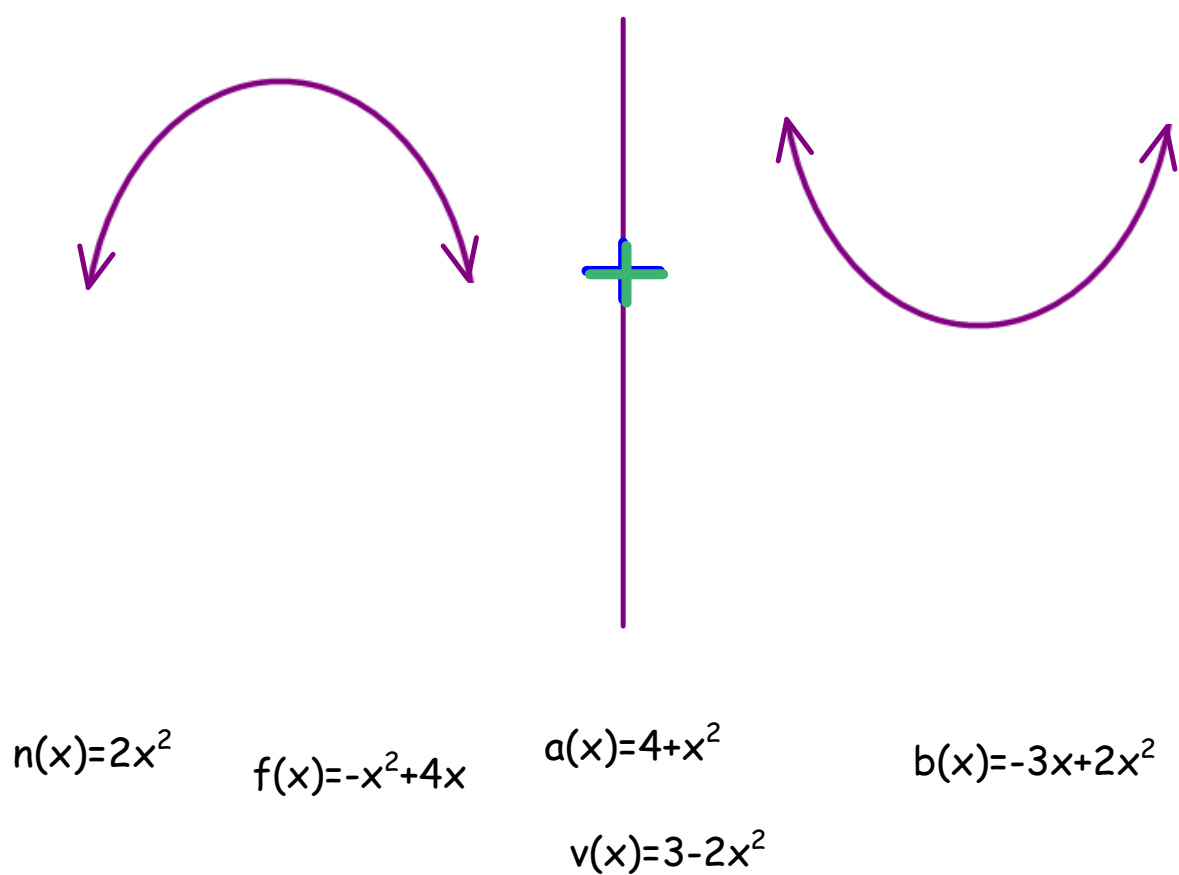
$f(x) = -x^2 - 6x + 1$   $m(x) = \frac{1}{4}x^2 + 2x$

Excel/Wiki Version

x	f(x)	m(x)
1	-6	
0	1	
-1	6	
-2	9	
-3	10	
-4	9	
-5	6	
-6		
-7		
-8		
-9		



$11^2 - 6(1) + 1$        $-1(-8)^2 - 6(-8) + 1$

Vertex-Max/Min

### Practice and Apply

Show that each function is a quadratic function by writing it in the form  $f(x) = ax^2 + bx + c$  and identifying  $a$ ,  $b$ , and  $c$ .

13.  $f(x) = (x - 3)(x + 8)$

15.  $g(x) = (4 - x)(7 + x)$

17.  $g(x) = -(x - 2)(x + 6)$

19.  $f(x) = 3(x - 2)(x + 1)$

21.  $h(x) = x(x - 3)$

23.  $g(x) = (2x + 3)(4 - x)$

25.  $h(x) = (x - 4)(x + 4)$

14.  $k(x) = (x + 3)(x - 5)$

16.  $g(x) = (10 - x)(x + 4)$

18.  $f(x) = -(x + 3)(x - 9)$

20.  $h(x) = 2(x + 1)(3x - 4)$

22.  $f(x) = 2x(x + 5)$

24.  $f(x) = (4x + 1)(4 - x)$

26.  $f(x) = (x - 6)(x + 6)$

Identify whether each function is a quadratic function. Use a graph to check your answers.

27.  $f(x) = 3 - x^2$

29.  $f(t) = \frac{1}{4}t^2 + \frac{1}{2}t - \frac{2}{3}$

31.  $g(t) = t^2 - t^2(t + 7)$

28.  $g(s) = 3 - s$

30.  $h(x) = \frac{3x^2 + 4x + 1}{x + 1}$

32.  $h(x) = |x^2 + 5x - 2|$

State whether the parabola opens up or down and whether it

State whether the parabola opens up or down and whether the  $y$ -coordinate of the vertex is the minimum value or the maximum value of the function.

33.  $f(x) = -2x^2 - 2x$

34.  $f(x) = 8x^2 - x$

35.  $g(x) = -(3x^2 - x + 3)$

36.  $f(x) = 2 + 3x - 5x^2$

37.  $h(x) = 1 - 9x - x^2$

38.  $g(x) = -(x^2 + x - 12)$

39.  $g(x) = 3(x + 8)(-x + 9)$

40.  $h(x) = -(4x + 1)(x + 4)$

Exploration\_quadratics.xls