

Before we begin, are there any questions from last day's work?

Today's Learning Goal(s): *Water Leak last class* +&nbsp;nbsp;?

By the end of the class, I will be able to:

- a) determine the equation of a parabola when given the graph.

**If time at the end,  
Return and correct Unit 3 Summatives**

Warm-up

Discuss 1st and 2nd differences, max. vs. min, and axis of symmetry (from 3 lessons ago)

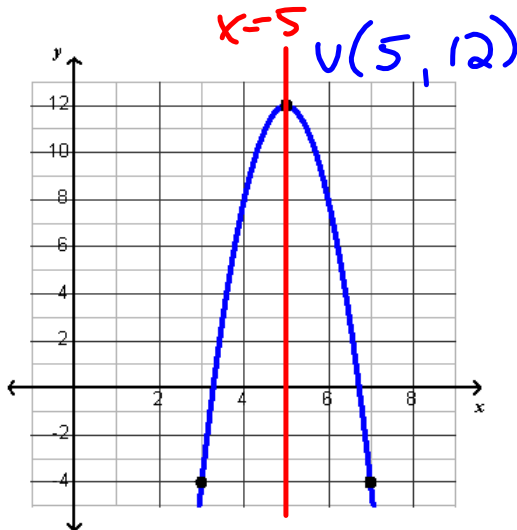
x	y
2	1
3	6
4	9
5	10
6	9

1st D:ff:  $6-1=5$ ,  $9-6=3$ ,  $10-9=1$ ,  $9-10=-1$

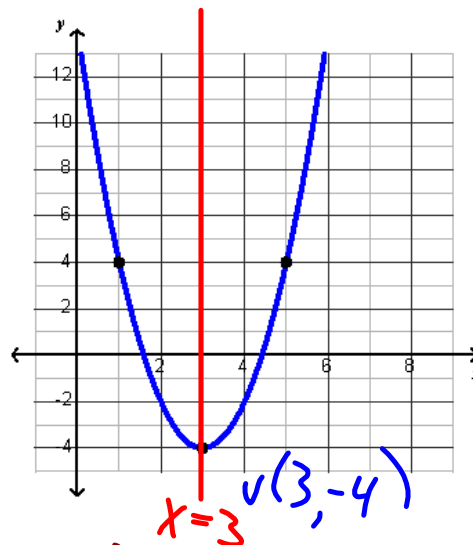
2nd D:ff:  $3-5=-2$ ,  $1-3=-2$ ,  $-1-1=-2$

∴ the table represents a quadratic relation,  
 because the 2nd differences are constant.

Ex. For each sketch below, label the vertex, and write the equation of the axis of symmetry.



the maximum value is 12,  
 and it occurs when  $x=5$ .



the minimum value is -4,  
 and it occurs when  $x=3$ .

Correct p.212 #1,2 orally (from 2 lessons ago...should have been done at start of lesson 4.4 Day1)

Correct yesterday's 6 graphs (on the next 2 pages, use student random for volunteers?)

Correct yesterday's 6 graphs

MBF 3CI **4.4 The Quadratic Relation: Vertex Form** (Day 2)

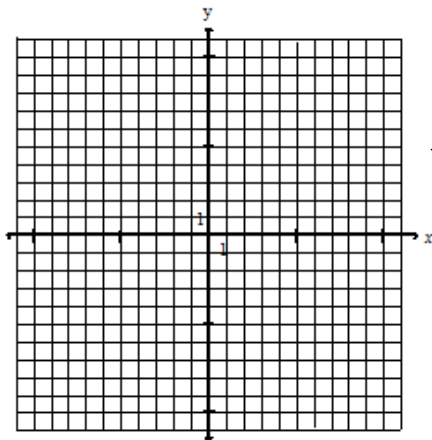
Date: \_\_\_\_\_

$y = a(x-h)^2 + k$  vertex ( , )

Graph:

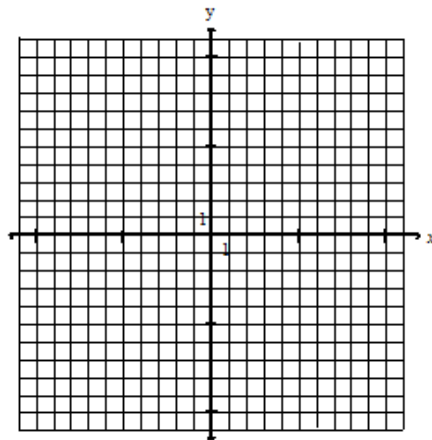
a)  $y = 2(x+2)^2 - 6$

b)  $y = -4x^2$



MG

x	y
1	1
2	4
3	9
4	16
5	25
6	36

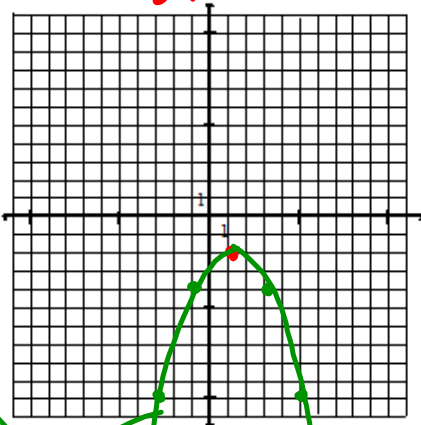


MG

x	y
1	1
2	4
3	9
4	16
5	25
6	36

c)  $y = -0.5(x-1)^2 - 2$   
 $= -\frac{1}{2}(x-1)^2 - 2$  V(1, -2)

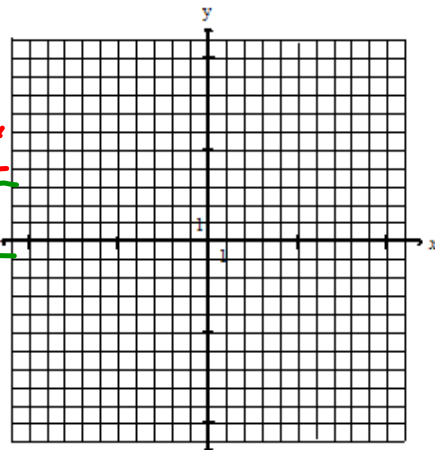
d)  $y = x^2 + 5$



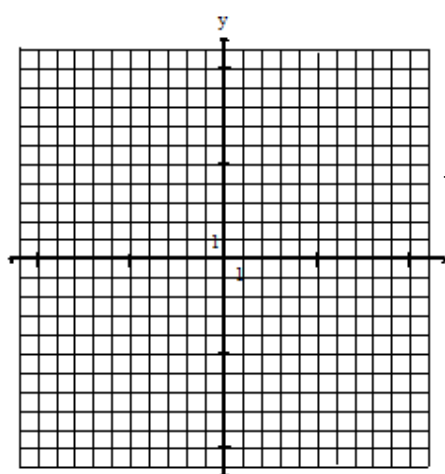
MG

x	y
1	1
2	4
3	9
4	16
5	25
6	36

$-\frac{1}{2}x$   
 $-0.5$   
 $-2$   
 $-8$

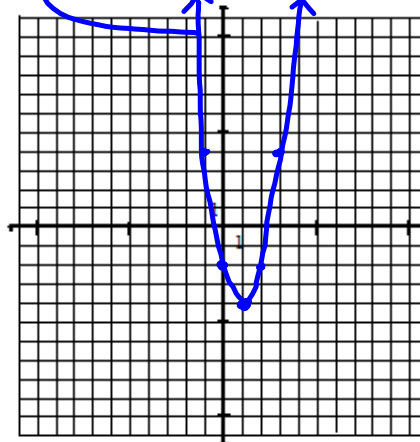


e)  $y = -3x^2 + 4$



MG	
x	y
1	1
2	4
3	9
4	16
5	25
6	36

f)  $y = -4 + 2(x-1)^2$       $V(1, -4)$   
 $(= 2(x-1)^2 - 4)$



MG	
x	y
1	1
2	4
3	9
4	16
5	25
6	36

$y = 2x$

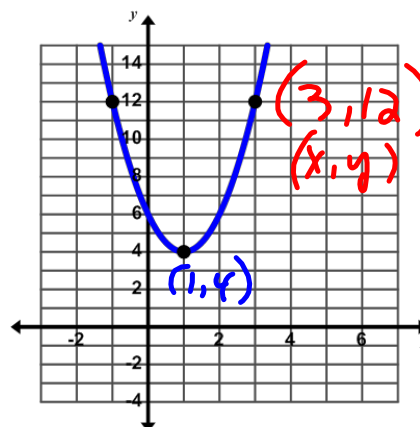
$y = a(x-h)^2 + k$

MBF 3CI 4.4 The Quadratic Relation: Vertex Form(Day 3)Date: Apr. 18/17

$$y = a(x - h)^2 + k$$

Ex. 1 Determine the equation of the parabola, in vertex form, when given the graph.

- ① Begin with finding the vertex.
- ② Write the "starter" equation. (We don't know "a" yet.)
- ③ Find another point on the graph other than the vertex.
- ④ Substitute the new point's coordinates in the equation.
- ⑤ Solve.
- ⑥ Write the conclusion...this is the final equation.

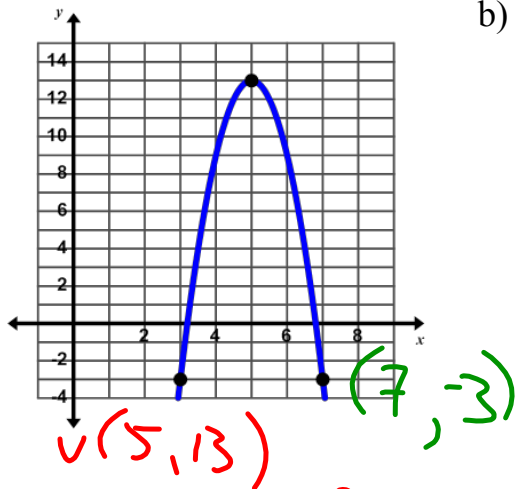


$$\begin{aligned} &v(1, 4) \\ &y = a(x - 1)^2 + 4 \\ &12 = a(3 - 1)^2 + 4 \\ &= a(2)^2 + 4 \\ &12 = 4a + 4 \\ &12 - 4 = 4a \\ &8 = 4a \\ &\frac{8}{4} = a \\ &2 = a \end{aligned}$$

$\therefore y = 2(x - 1)^2 + 4$  is the equation.

Ex. 2 Determine the equation of each parabola, in vertex form.

a)



$$y = a(x - 5)^2 + 13$$

$$-3 = a(7 - 5)^2 + 13$$

$$-3 = a(2)^2 + 13$$

$$-3 = 4a + 13$$

$$-3 - 13 = 4a$$

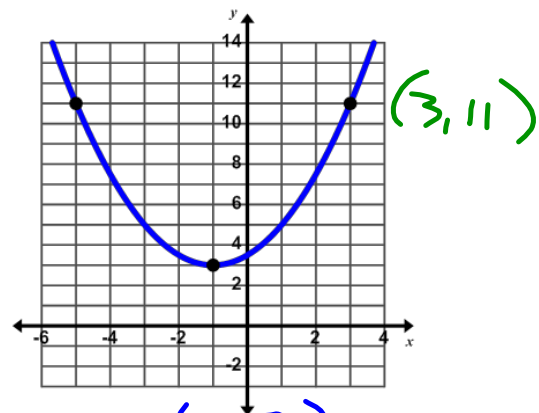
$$-16 = 4a$$

$$\frac{-16}{4} = a$$

$$a = -4$$

$\therefore y = -4(x - 5)^2 + 13$   
is the equation.

b)



$$v(-1, 3)$$

$$y = a(x + 1)^2 + 3$$

$$11 = a(3 + 1)^2 + 3$$

$$= a(4)^2 + 3$$

$$11 = 16a + 3$$

$$11 - 3 = 16a$$

$$8 = 16a$$

$$\frac{8}{16} = \frac{16a}{16}$$

$$\frac{1}{2} = a$$

$\therefore y = \frac{1}{2}(x + 1)^2 + 3$   
is the equation.