

3.4 day 2 notes

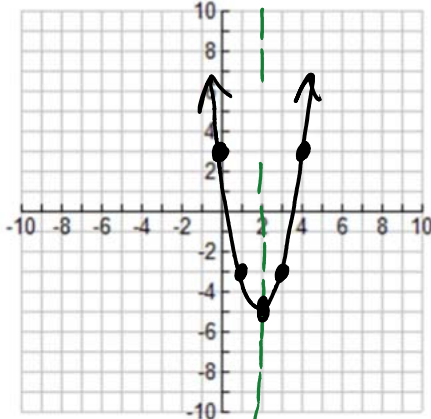
Friday, October 21, 2016 8:53 AM

A series of horizontal blue lines for writing notes, with a vertical red margin line on the left side.

Graph using standard form methods and identify the information that follows.

1. $y = 2x^2 - 8x + 3$

A.O.S: $x = -b/2a$



Axis of symmetry: $x = \frac{8}{2} = 2$

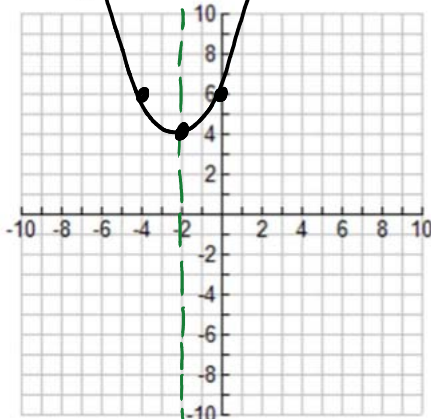
Vertex: $(2, -5)$

y-intercept: $(0, 3)$

Increasing interval: $[2, \infty)$
Decreasing interval: $(-\infty, 2]$
Range: $[-5, \infty)$

$$\begin{aligned} &2(1)^2 - 8(1) + 3 \\ &= 2 - 8 + 3 \\ &= -3 \end{aligned}$$

2. $y = \frac{1}{2}x^2 + 2x + 6$



Axis of symmetry: $x = -2 / (2 \cdot \frac{1}{2}) = -2$

Vertex: $(-2, 4)$

y-intercept: $(0, 6)$

Increasing interval: $[-2, \infty)$

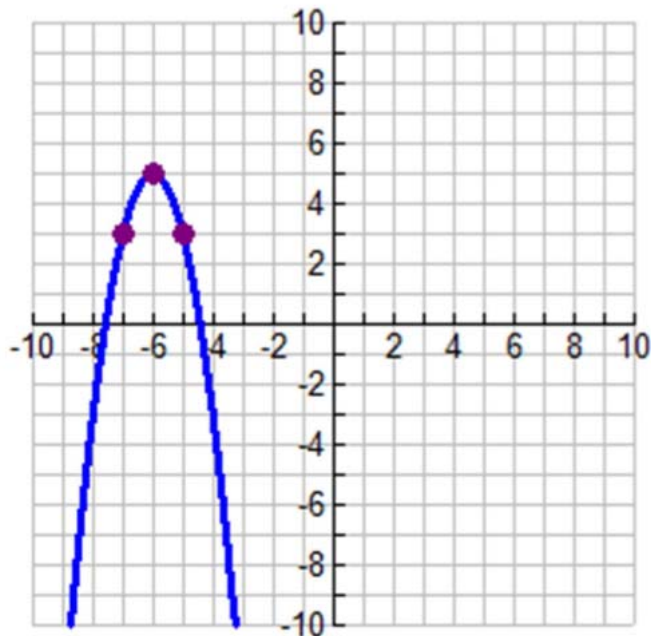
Decreasing interval: $(-\infty, -2]$

Range: $[4, \infty)$

$$\begin{aligned} &\frac{1}{2}(-2)^2 + 2(-2) + 6 \\ &= \frac{1}{2} \cdot 4 - 4 + 6 \\ &= 4 \end{aligned}$$

$$\begin{aligned} &\frac{1}{2}(2)^2 + 2 \cdot 2 + 6 \\ &= \frac{1}{2} \cdot 4 + 4 + 6 \\ &= 12 \end{aligned}$$

3. Write *the* equation of the parabola below.



$$(-5, 3)$$

$$y = a(x + 6)^2 + 5$$

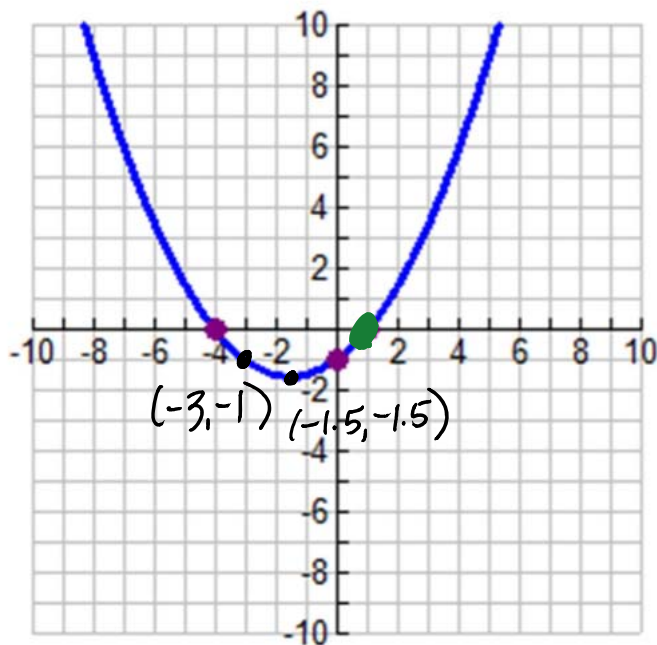
$$3 = a(-5 + 6)^2 + 5$$

$$3 = a \cdot 1 + 5$$

$$-2 = a$$

$$y = -2(x + 6)^2 + 5$$

4. Write *the* equation of the parabola below.



$$(-3, -1) \quad (-1.5, -1.5)$$

$$y = a(x + 4)(x - 1)$$

$$-1 = a(0 + 4)(0 - 1)$$

$$-1 = a \cdot 4 \cdot -1$$

$$\frac{1}{4} = a$$

$$y = \frac{1}{4}(x + 4)(x - 1)$$

5. Write the equation of the parabolas below:

a.

x	y
-1	-26
0	-11
1	-2
2	1
3	-2
4	-11
5	-26

vertex

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

$$-11 = a(0-2)^2 + 1$$

$$-11 = a \cdot 4 + 1$$

$$-12 = 4a$$

$$-3 = a$$

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

b.

x	y
0	30
1	16
2	6
3	0
4	-2
5	0
6	6

vertex

$$y = a(x-3)(x-5)$$

$$30 = a(0-3)(0-5)$$

$$30 = a \cdot -3 \cdot -5$$

$$2 = a$$

$$y = 2(x-3)(x-5)$$

$$(2x-6)(x-5)$$

$$= 2x^2 - 10x - 6x + 30$$

$$= 2x^2 - 16x + 30$$

$$\rightarrow 2(x^2 - 8x + 16) - 2$$

$$= 2x^2 - 16x + 32 - 2$$

$$= 2x^2 - 16x + 30$$

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

6. Write the equation of the parabola that passes through the following points: (-1, -12), (2, -9), and (1, -6).

$$y = ax^2 + bx + c$$

$$-12 = a(-1)^2 + b(-1) + c$$

$$-9 = a(2)^2 + b(2) + c$$

$$-6 = a(1)^2 + b(1) + c$$

Eliminate c

$$a - b + c = -12$$

$$-4a - 2b - c = 9$$

$$-3a - 3b = -3$$

$$a + b = 1$$

$$a - b + c = -12$$

$$-a - b - c = 6$$

$$-2b = -6$$

$$b = 3$$

$$\begin{cases} a - b + c = -12 \\ 4a + 2b + c = -9 \\ a + b + c = -6 \end{cases}$$

$$b = 3$$

$$a = -2$$

$$c = -7$$

$$y = -2x^2 + 3x - 7$$