

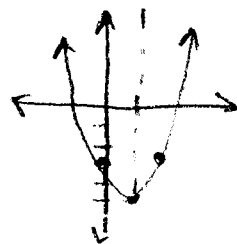
BE - Alg. 2 Thursday 3-10-11

① GIVEN:  $y = 2(x-1)^2 - 5$

- Ⓐ Does the parabola open up or down?  
Ⓑ What are the coordinates of the vertex?  
Ⓒ Is the vertex a maximum or minimum?  
Ⓓ What is the equation of the AOS?  
(axis of symmetry)

② Change #① to  $y = ax^2 + bx + c$  form

① Ⓐ ↗ ↗ Ⓑ (1, -5) Ⓒ minimum Ⓓ  $x = 1$



②  $y = 2[x^2 - 2x + 1] - 5$

$$y = 2x^2 - 4x + 2 - 5$$

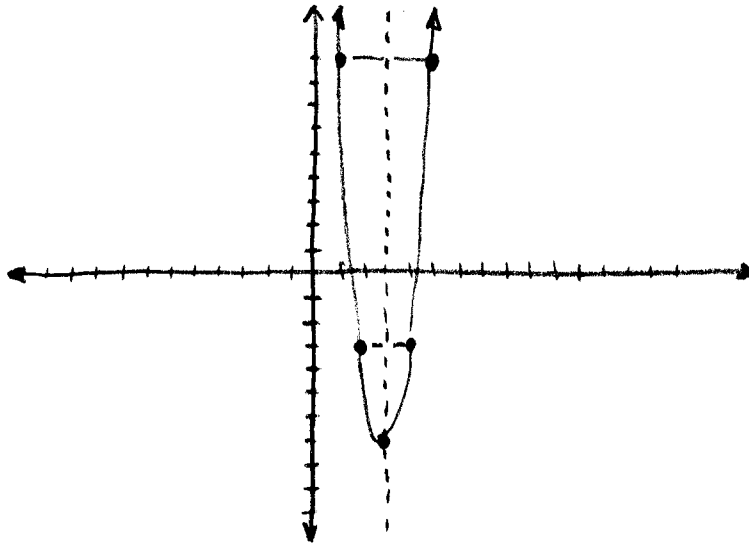
$y = 2x^2 - 4x - 3$  • AOS  $\Rightarrow x = -\frac{b}{2a} = \frac{-(-4)}{2(2)} \checkmark$

•  $V(1, ?)$

①  $y = 4(x-3)^2 - 7$

Vertex  $\rightarrow (3, -7)$  AOS  $\Rightarrow x = 3$   $a = 4 \Rightarrow \text{smiley}$

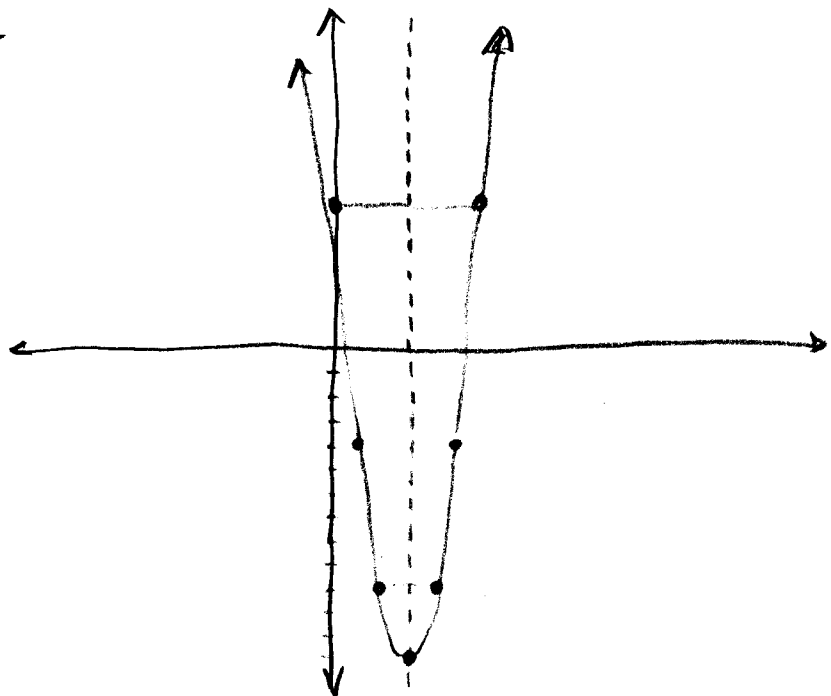
x	y
3	-7
0	29
1	9
2	-3



④  $y = 2x^2 - 12x + 6$

$a = + \text{smiley}$  AOS  $\Rightarrow x = \frac{-b}{2a}$   
 $x = \frac{12}{4} = 3$

x	y
Vertex 3	$2(3)^2 - 12(3) + 6$ $18 - 36 + 6 = -12$
0	6
2	$8 - 24 + 6 = -10$
1	$2 - 12 + 6 = -4$



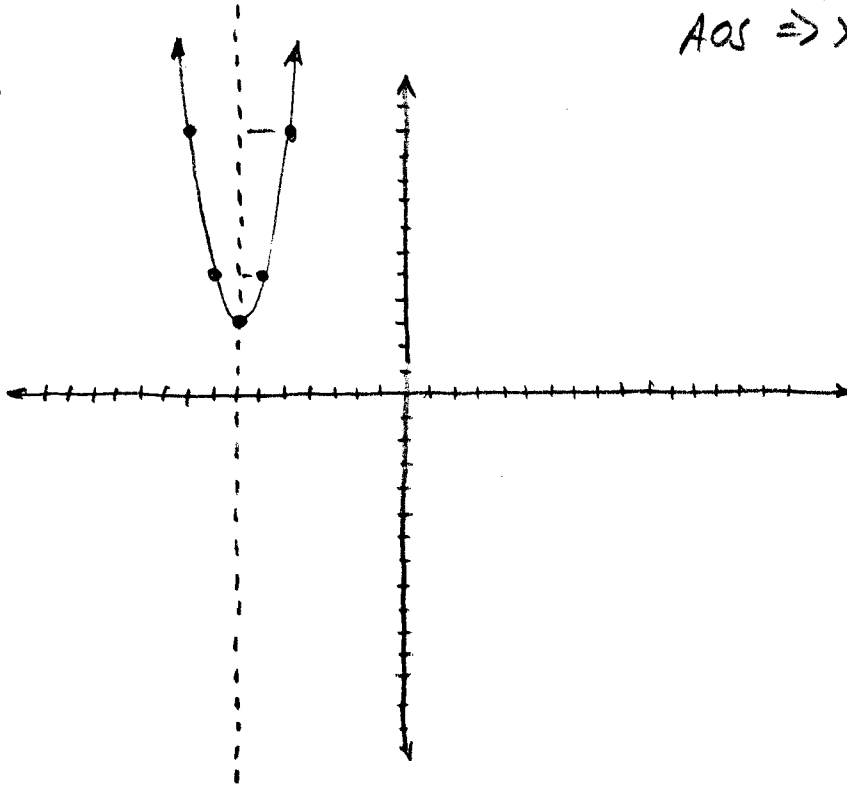
$$\textcircled{6} \quad y = 2(x+7)^2 + 3$$

$$a = +2 \Rightarrow \text{smiley face}$$

$$\text{Vertex} = (-7, 3)$$

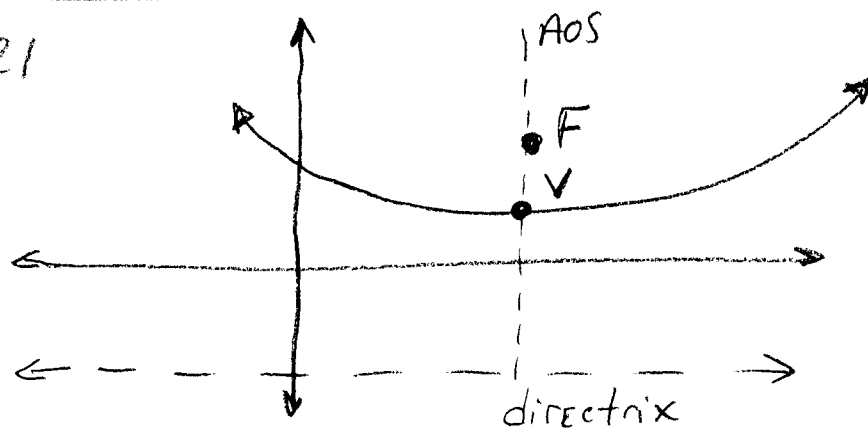
$$\text{AOS} \Rightarrow x = -7$$

x	y
-7	3
-6	5
-4	21
-5	11



FINDING the values for the Focus,  $F(x, y)$   
(A point)  
AND the directrix,  $y = \text{number}$   
(A horizontal line).

SEE Pg 421



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

$$\text{AOS} \Rightarrow x = h$$

$$V \Rightarrow (h, k)$$

$$F \Rightarrow \left(h, k + \frac{1}{4a}\right)$$

$$\text{Directrix} \Rightarrow y = k - \frac{1}{4a}$$

BE Example  $y = 2(x-1)^2 - 5$   $\therefore a=2$   $h=1$   $k=-5$

$$\text{AOS} \Rightarrow x = 1$$

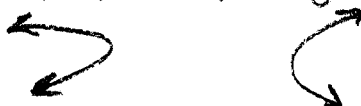
$$V \Rightarrow (1, -5) \text{ halfway between Focus \& Directrix}$$

$$F \Rightarrow \left(1, -5 + \frac{1}{4(2)}\right) = \left(1, -4\frac{7}{8}\right) = F$$

$$\text{Directrix} \Rightarrow y = -5 - \frac{1}{8} \Rightarrow y = -5\frac{1}{8}$$

4.

If you swap  $x, y, h, k$  you get  
parabolas that open to left & right



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These are not functions. Why not?

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Let's look at a parabola on  
"conic paper" using  $y = a(x-h)^2 + k$   
(see next page)

(EX)  $y = \frac{1}{4}(x)^2 - 7$

$$a = \frac{1}{4} \quad h = 0 \quad k = -7$$

since  $(x-0)^2$

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$$\text{AOS} \Rightarrow x = 0$$

$$V \Rightarrow (0, -7)$$

$$F \Rightarrow \left(0, -7 + \frac{1}{4\left(\frac{1}{4}\right)}\right) = (0, -6)$$

$$\text{Directrix} \Rightarrow y = -7 - \frac{1}{4\left(\frac{1}{4}\right)} = -8$$

Homework

HW: Can you find the equation of your  
conic paper parabola? (put focus at center)

② PAGE 423 # 5, 7, 9

# Conic Graph Paper

(circles and lines)

