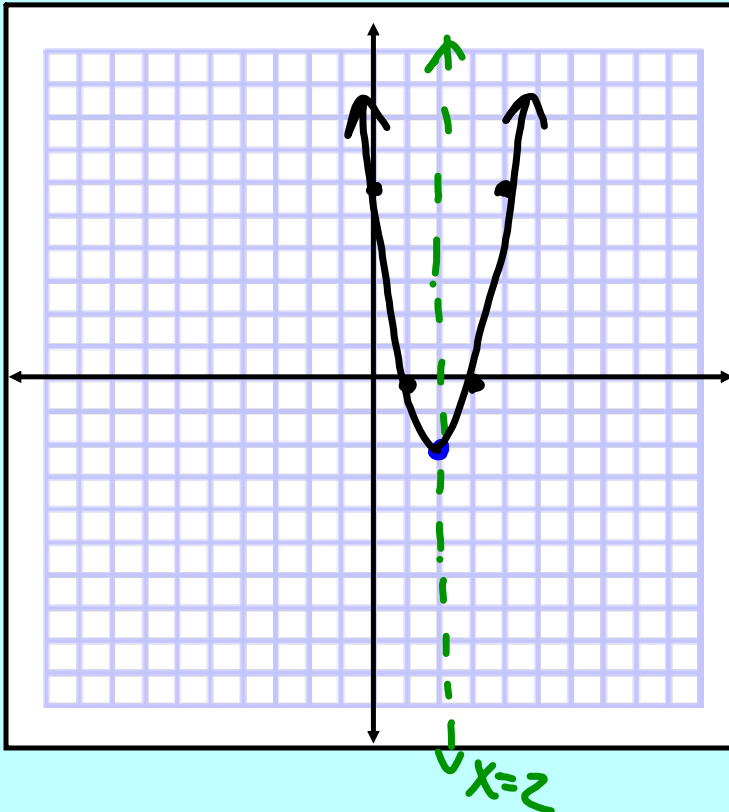


B. Graph Standard Form

Example: $f(x) = 2x^2 - 8x + 6$



1. Determine if the graph opens up or down.
2. Find the axis of symmetry.
3. Find the vertex & plot.
4. Make a table of values (find two points on either side of the vertex) & plot.
5. Connect the points with a smooth curve.

① $a = 2$ opens up

② $x = \frac{-b}{2a} = \frac{-(-8)}{2(2)} = \frac{8}{4}$
 $x = 2$

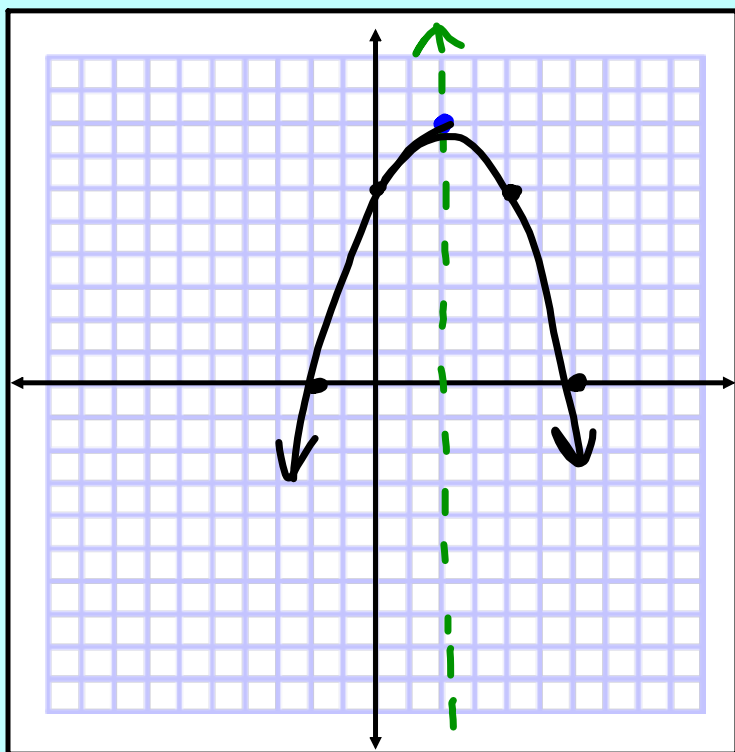
③ $y = 2x^2 - 8x + 6$
 $= 2(2)^2 - 8(2) + 6$
 $= 2(4) - 16 + 6$
 $= 8 - 16 + 6$
 $= -8 + 6$
 $y = -2$ vertex
(2, -2)

④

x	$y = 2x^2 - 8x + 6$	y
0	$2(0)^2 - 8(0) + 6 = 0 - 0 + 6$	6
1	$2(1)^2 - 8(1) + 6 = 2 - 8 + 6$	0
2	$2(1) - 8 + 6$	-2
3	$2(3)^2 - 8(3) + 6 = 18 - 24 + 6$	0
4	$2(4)^2 - 8(4) + 6 = 32 - 32 + 6$	6

B. Graph Standard Form

Example: $g(x) = -\frac{1}{2}x^2 + 2x + 6$



① $a = -\frac{1}{2}$ opens down

② $x = \frac{-b}{2a} = \frac{-2}{2(-\frac{1}{2})} = -\frac{2}{-1}$
 $x = 2$

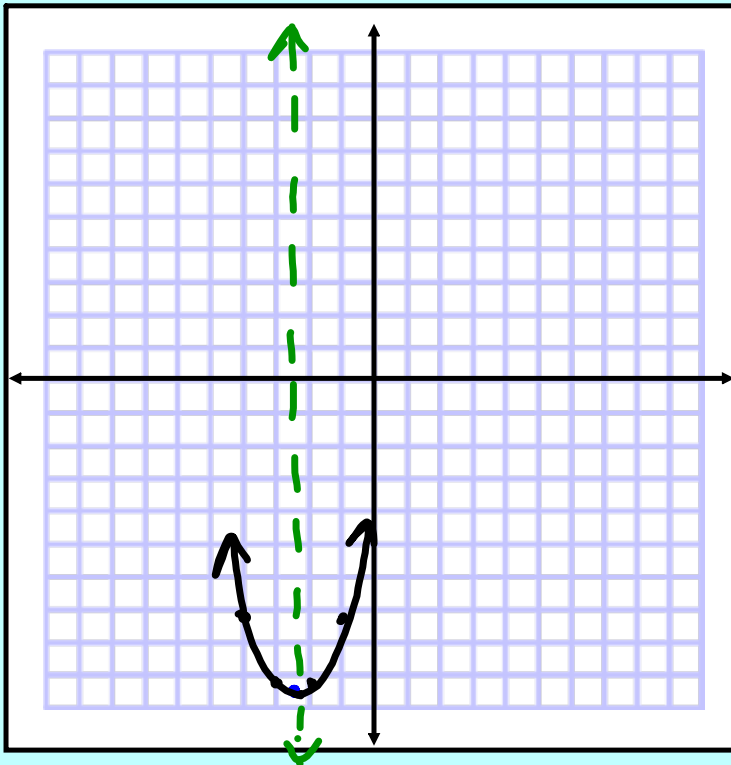
③ $y = -\frac{1}{2}x^2 + 2x + 6$
 $= -\frac{1}{2}(2)^2 + 2(2) + 6$
 $= -\frac{1}{2}(4) + 4 + 6$
 $= -2 + 4 + 6 = 8$

Vertex: $(2, 8)$

④ x	$y = -\frac{1}{2}x^2 + 2x + 6$	y
-2	$-\frac{1}{2}(-2)^2 + 2(-2) + 6 = -\frac{1}{2}(4) - 4 + 6$ $= -2 - 4 + 6$	0
0	$-\frac{1}{2}(0)^2 + 2(0) + 6 = 0 + 0 + 6$	6
2	~~~~~	8
4	$-\frac{1}{2}(4)^2 + 2(4) + 6 = -\frac{1}{2}(16) + 8 + 6$ $= -8 + 8 + 6$	6
6	$-\frac{1}{2}(6)^2 + 2(6) + 6 = -\frac{1}{2}(36) + 12 + 6$ $= -18 + 12 + 6$	0

B. Graph Standard Form

Example: $y = x^2 + 5x - 3$



① $a = 1$ **opens up**

② $x = \frac{-b}{2a} = \frac{-5}{2(1)} = \frac{-5}{2}$
 $x = -2\frac{1}{2}$

③ $y = x^2 + 5x - 3$
 $= \left(\frac{-5}{2}\right)^2 + 5\left(\frac{-5}{2}\right) - 3$
 $= \frac{25}{4} + \frac{-25 \cdot 2}{2 \cdot 2} - \frac{3 \cdot 4}{1 \cdot 4}$
 $= \frac{25}{4} + \frac{-50}{4} - \frac{12}{4}$
 $= \frac{-25}{4} - \frac{12}{4} = \frac{-37}{4}$
 Vertex: $\left(-2\frac{1}{2}, -9\frac{1}{4}\right)$

④ x	$y = x^2 + 5x - 3$	y
-4	$(-4)^2 + 5(-4) - 3$ $16 + -20 - 3 = -4 - 3$	-7
-3	$(-3)^2 + 5(-3) - 3$ $9 + -15 - 3 = -6 - 3$	-9
$-2\frac{1}{2}$	$(-2)^2 + 5(-2) - 3$ $4 + -10 - 3 = -6 - 3$	$-9\frac{1}{4}$
-2	$(-1)^2 + 5(-1) - 3$ $1 + -5 - 3 = -4 - 3$	-7

1-1 Standard Form of Quadratic Functions.doc