

Graphing parabolas in Standard Form

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

if $a > 0$ (positive), opens up

if $a < 0$ (negative), opens down

if $|a| = 1$, normal width

if $|a| < 1$, wider

if $|a| > 1$, narrower

vertex (h, k)

axis of symmetry: $x = h$

Ex 0.5 Graph $y = x^2$

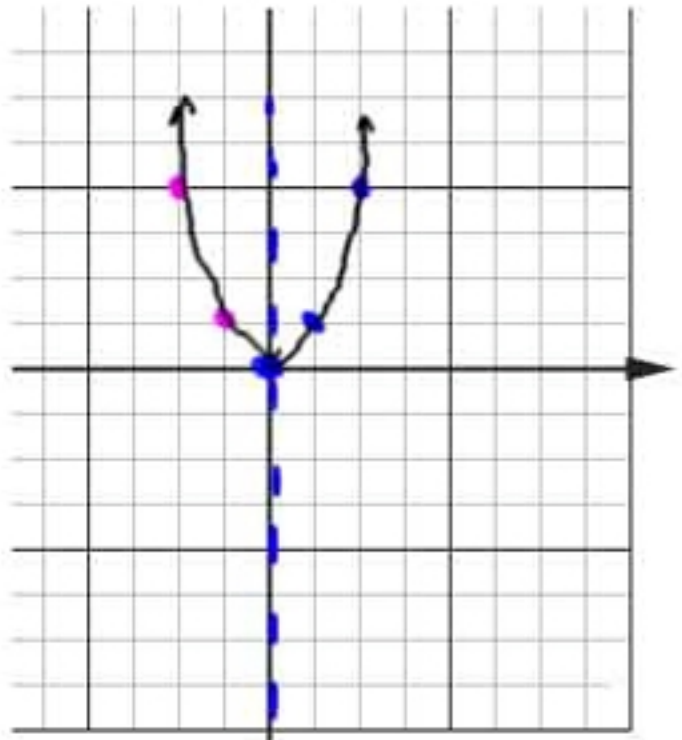
$$y = 1(x - 0)^2 + 0$$

up, normal width

vertex $(0, 0)$

axis of symmetry: $x = 0$
(the y -axis)

x	y
1	1
2	4

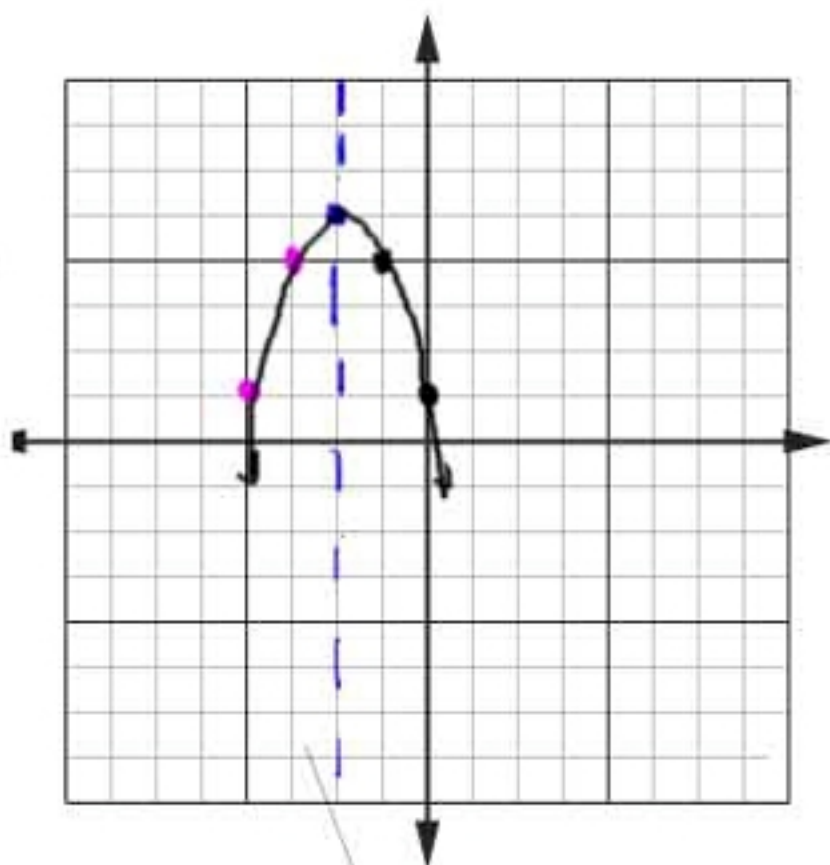


Ex1 Graph $y = -(x+2)^2 + 5$

down, normal
vertex: $(-2, 5)$

axis of sym: $x = -2$

x	y
-1	4
0	1



Ex2 Graph

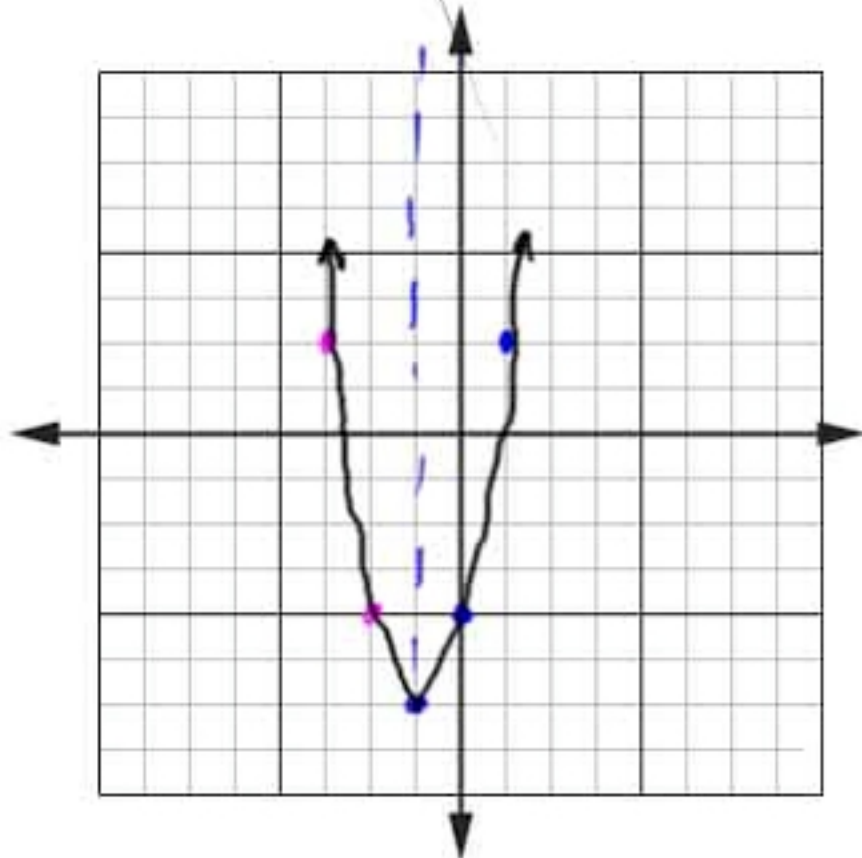
$$y = 2(x+1)^2 - 6$$

up, narrow

vertex $(-1, -6)$

axis: $x = -1$

x	y
0	-4
1	2



EX 3 $y = a(x-h)^2 + k$

vertex $(1, -2)$ point $(3, 6)$

Find the equation:

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

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

$$6 = a(3 - 1)^2 - 2$$

$$6 = a(2)^2 - 2$$

$$6 = 4a - 2$$

$$8 = 4a$$

$$a = 2$$

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