

QUADRATIC FUNCTIONS

Standard form

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

$$y = x^2$$

Parabola

x	y
0	0
-1	1
-2	4
-3	9

Vertex Form

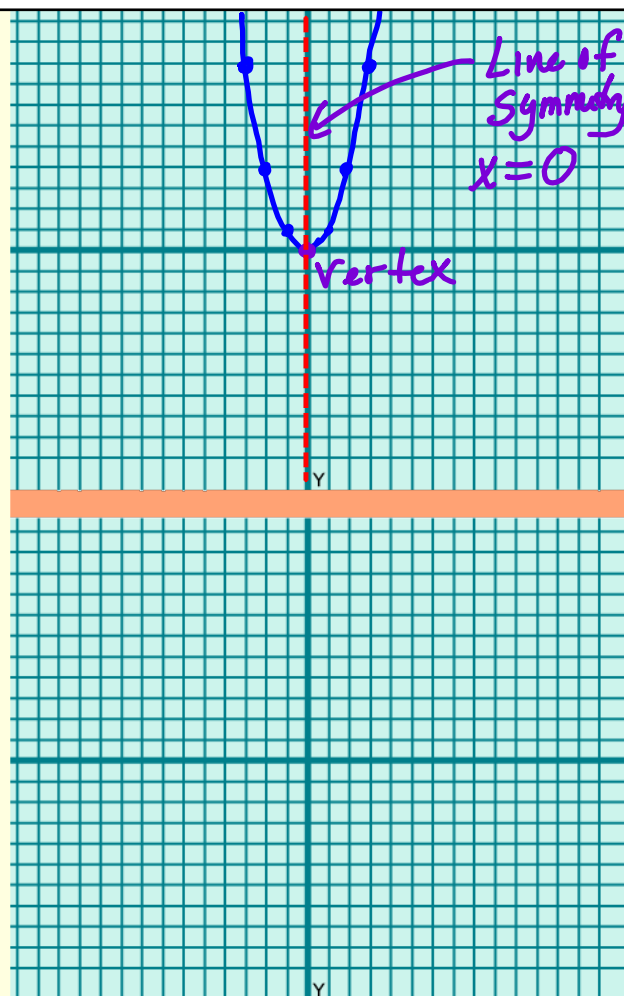
$$y = a(x-h)^2 + k$$

Vertex: (h, k) $\cup \cap$

direction: $+a$ up
 $-a$ down

line of symmetry: $x = h$

width: $|a| > 1$ narrow
 $|a| = 1$ normal
 $0 < |a| < 1$ wide



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

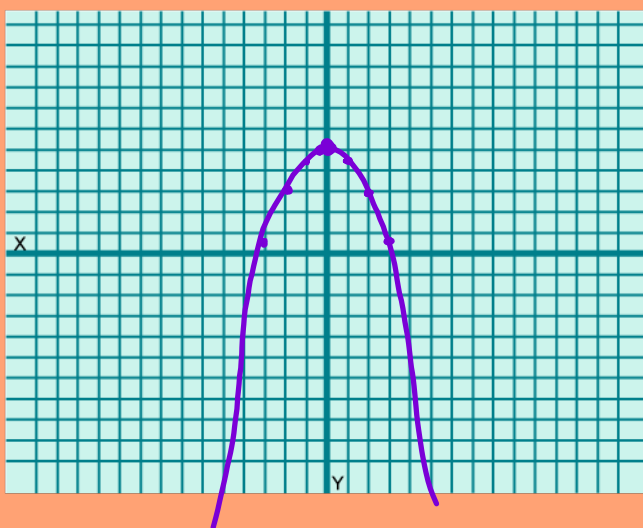
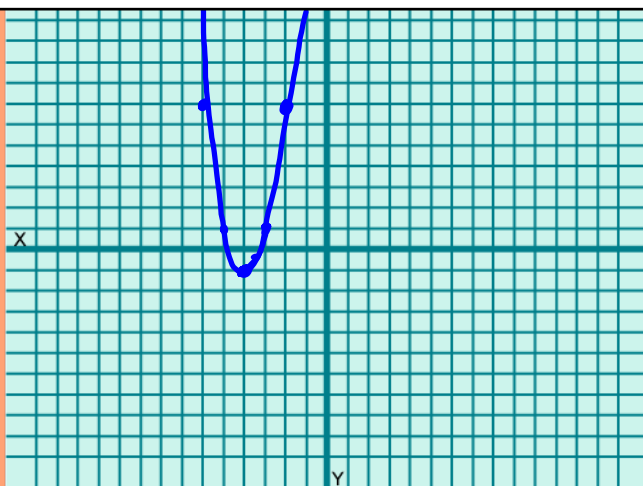
↑ Left Down
 narrow 4
 UP

0	0
1	2
2	8
3	18

$$y = -\frac{1}{2}x^2 + 5$$

0	0
1	-1/2
2	-2
3	-4.5

UP
5



$$y = -2(x-4)^2 + 7$$

Vertex: $(\underline{4}, 7)$

Direction: Down

Line of Symm.: $x = 4$

Width: narrow

$$y = \frac{2}{3}(x+7)^2$$

Vertex: $(-7, 0)$

Direction: up

Line of Symm.: $x = -7$

Width: wide

$$y < -\frac{1}{2}(x-6)^2 + 5$$

Right 6 UP 5

0	0
1	1 -1/2
2	4 -2
3	9 -4.5

$$y \leq 3(x-2)^2 - 10$$

Right 2 Down 10

0	0
1	1 3
2	4 12
3	9 27

Shade down from vertex

