4.2 Translating Parabolas

Translation
- change in x → ←
- change in y ↑ ↓

base form $y = ax^2$

vertex at (0,0)

Vertex Form

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

vertex (h,k)

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

h is the change in x

$(x-3)^2$	$h=3$	x moved 3 right
$(x+2)^2$	$h=-2$	x moved 2 left
$(x)^2+4$	$k=4$	y moved up 4
x^2-1	$k=-1$	y moved down 1

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

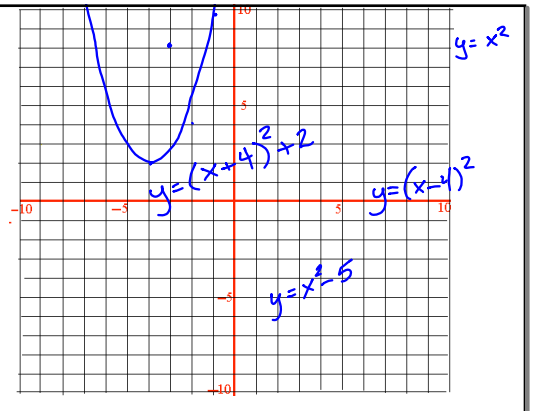
$h=3 \quad k=1$

$\rightarrow 3 \quad \uparrow 1$

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

$h=-5 \quad k=-3$

$\leftarrow 5 \quad \downarrow 3$



Vertex form

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

(h,k)

$y = ax^2 + bx + c$

k is not the y-int

find vertex and y-int

$y = (x-3)^2$ $\quad V = (3,0)$

$y = (-3)^2$

$y = 9$

$y = x^2 + 2$ $\quad V = (0,2)$

$y = 2$

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

$V = (3,5)$

$= -2(-3)^2 + 5 = -18 + 5$

$= -2(1) + 5 = -13$