Ex: Sketch $y = -(x+2)^2 - 1$

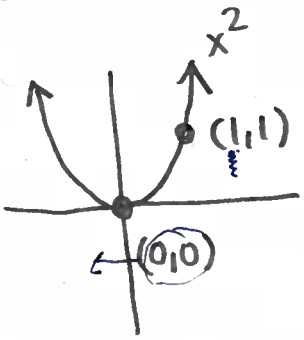
multiply y-vals by -1 → vertical refl → 2nd

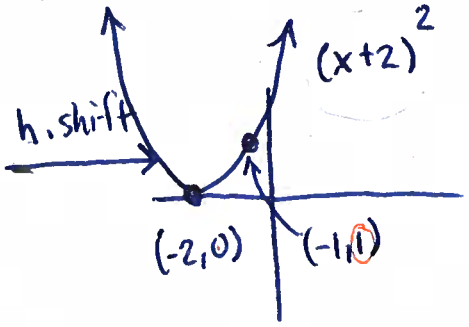
h. shift left by 2 → 1st

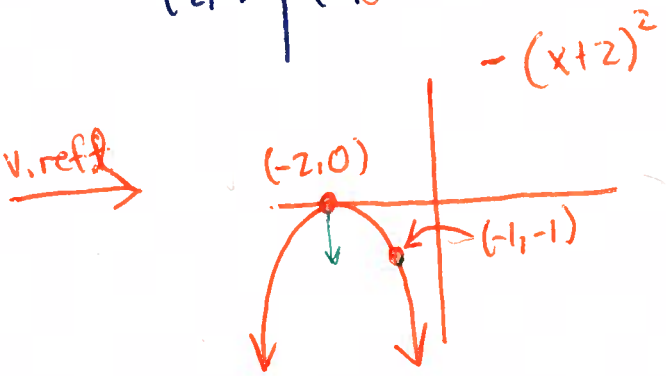
vert shift down by 1 → 3rd

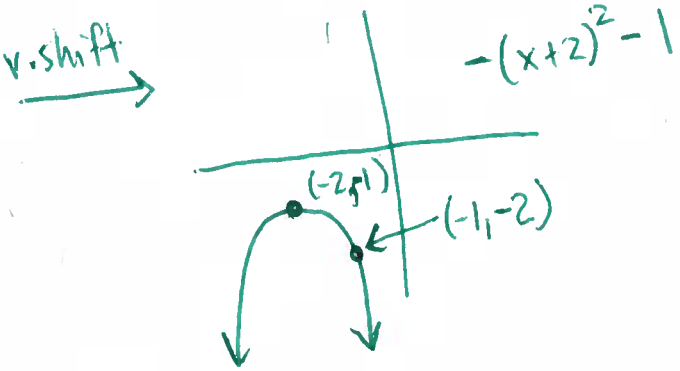
subtracts 1 from y-vals

Start with base function: x^2

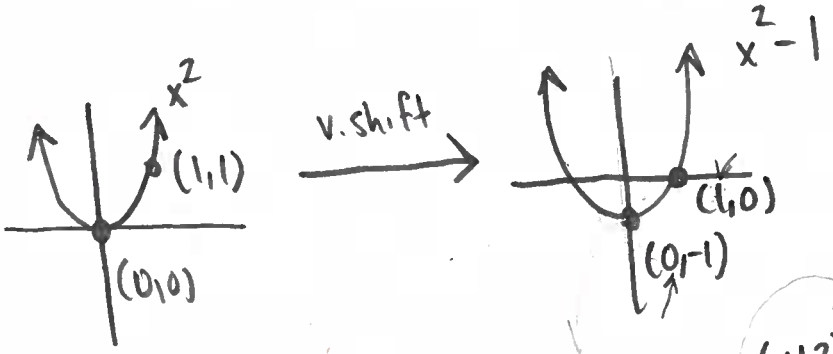




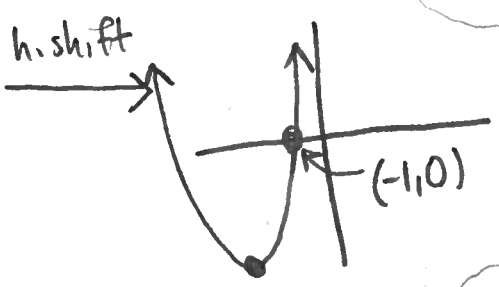




Q: What would have happened if I did v.shift first?



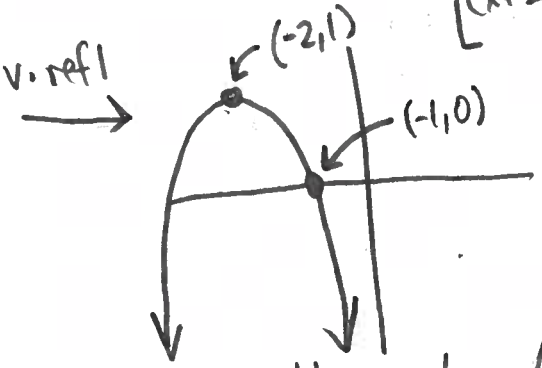
$(x+2)^2-1$



(-2,-1)

$-\left[(x+2)^2-1\right]=-(x+2)^2+1$

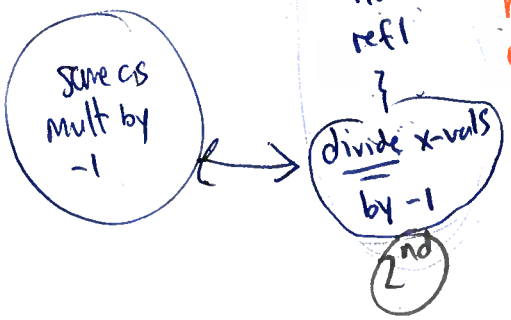
this was not the graph!!



Observation: order these transformations are applied in MATTERS!

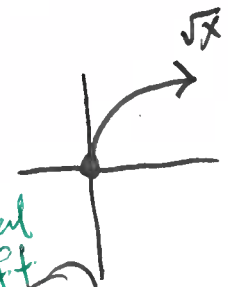
Ex: Sketch $y = \sqrt{-2x} + 5$

$\frac{a}{-1} = \frac{-a}{1} = -\frac{a}{1}$



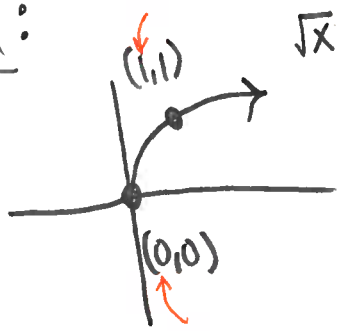
horiz refl } divide x-vals by -1 (2nd)

horizontal compression } divide x-vals by 2 (1st)

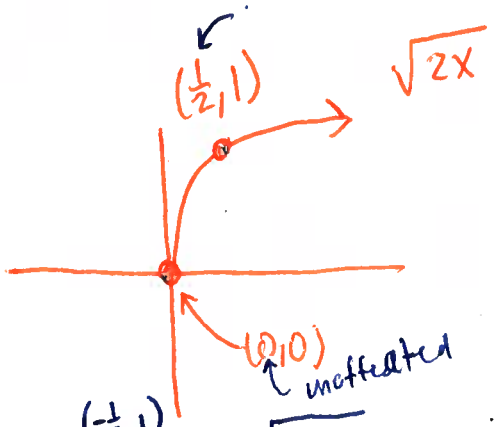


add 5 to y-values

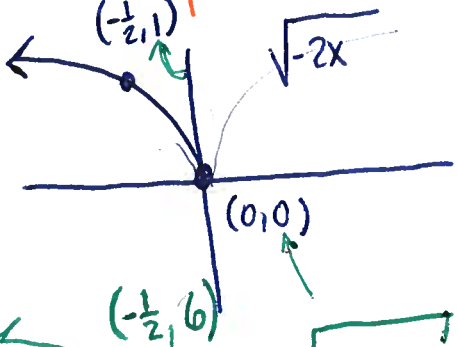
Soln:

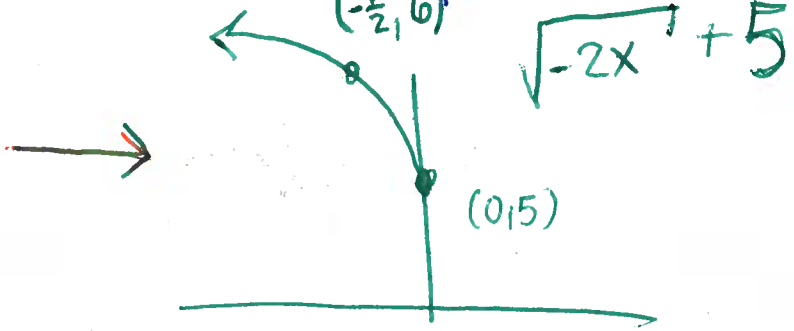


horiz comp.



h. refl





-x-1

Ex: Sketch $y = -2\left|-(x+1)\right| - 3$

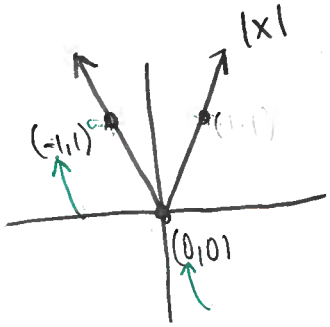
vert. refl & mult y-vals by -1 — 4th

v. stretch mult. y-vals by 2 — 3rd

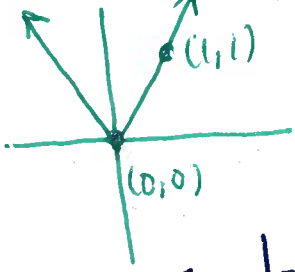
h. refl div x-vals by -1

h. shift left by 1 — subtract 1 from x-vals — 2nd

v. shift subtract 3 from y-vals — 5th — 1st

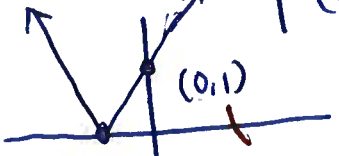


h. refl →

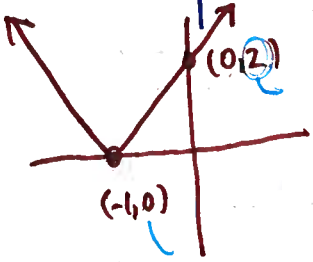


replace w/ x+1

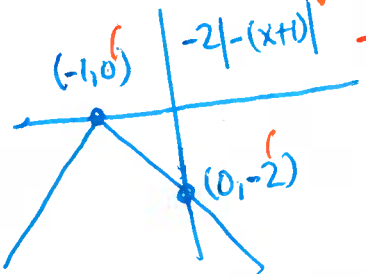
h. shift →



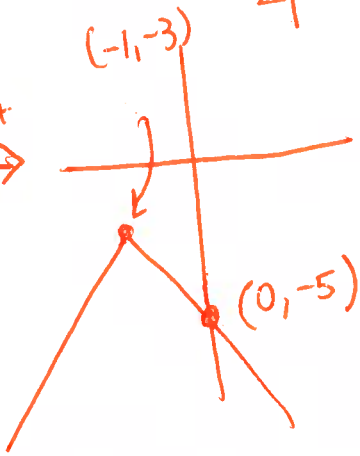
v. str →



v. refl →



v. shift →



-2-3=-5