

10/6/Precalc

Last time

test
(functions 2.2)

§ 2.4-2.5

Library of functions

(A)

$$y = mx + b$$

slope

y-int

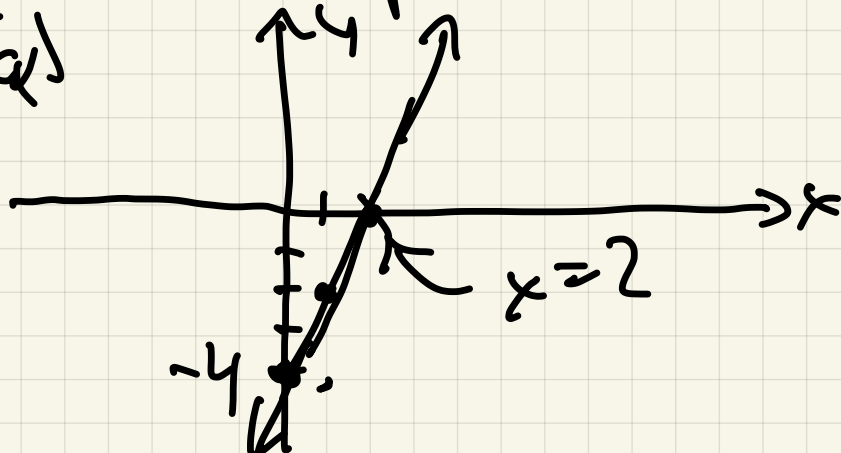
(§2.1)

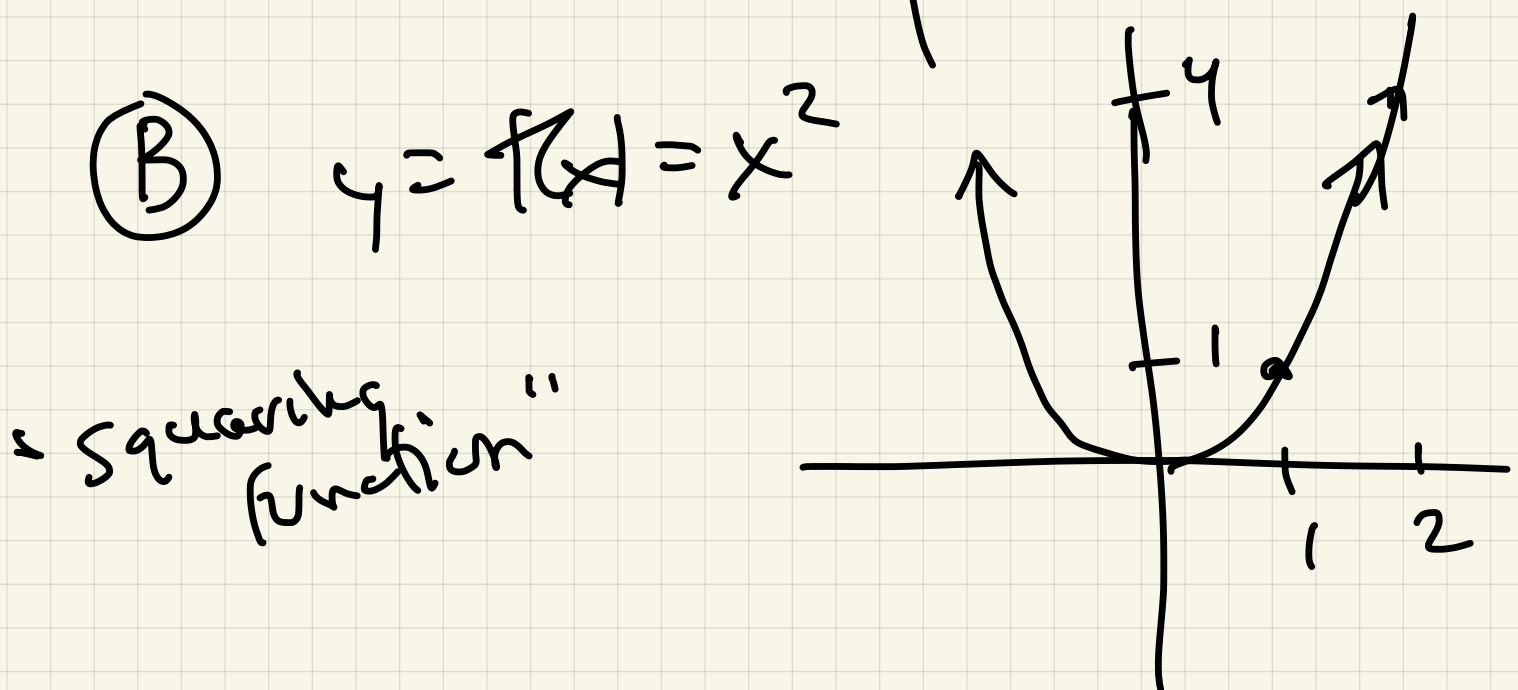
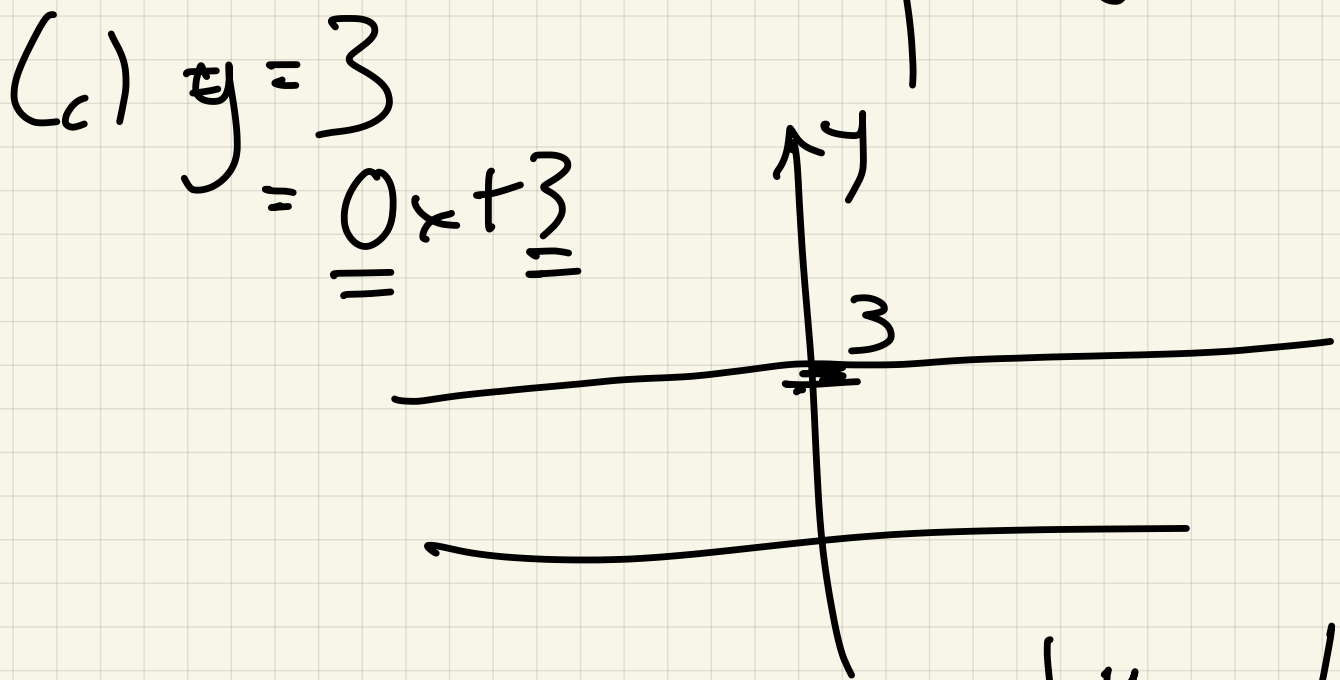
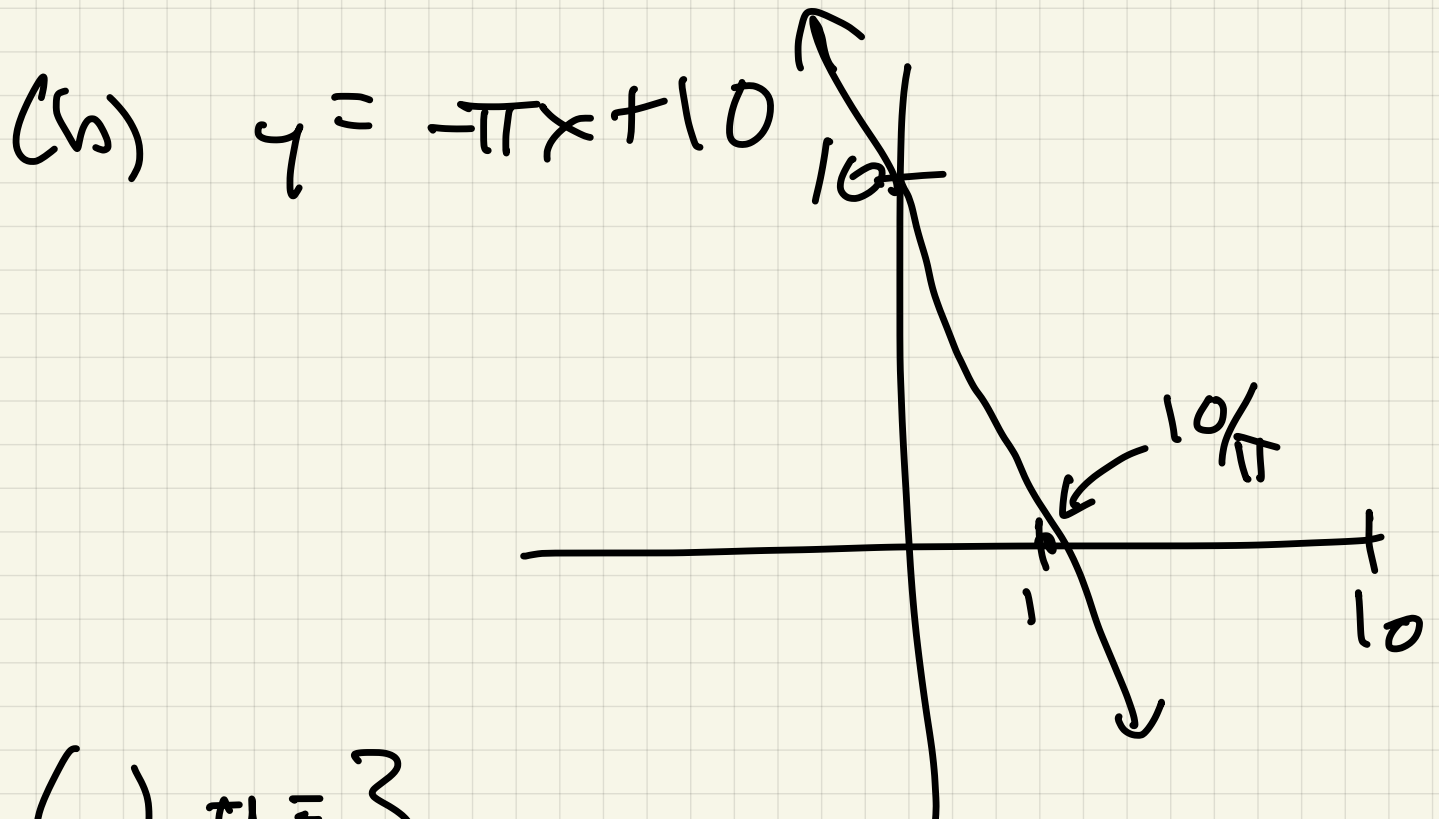
Ex 1 $y = 2x - 4$

slope 2

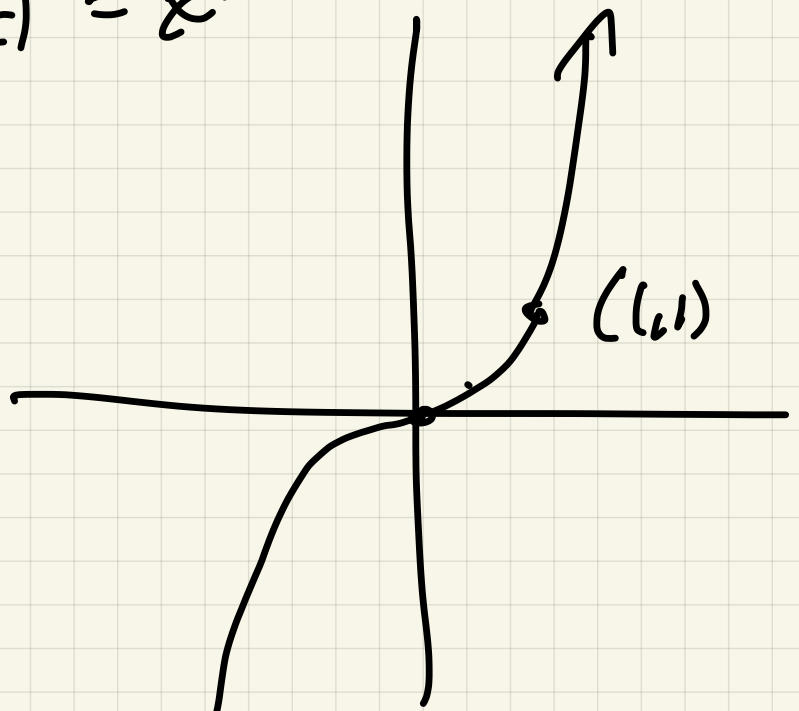
-4 y-int

(a)





(C) $y = f(x) = x^3$
 "cubing function"

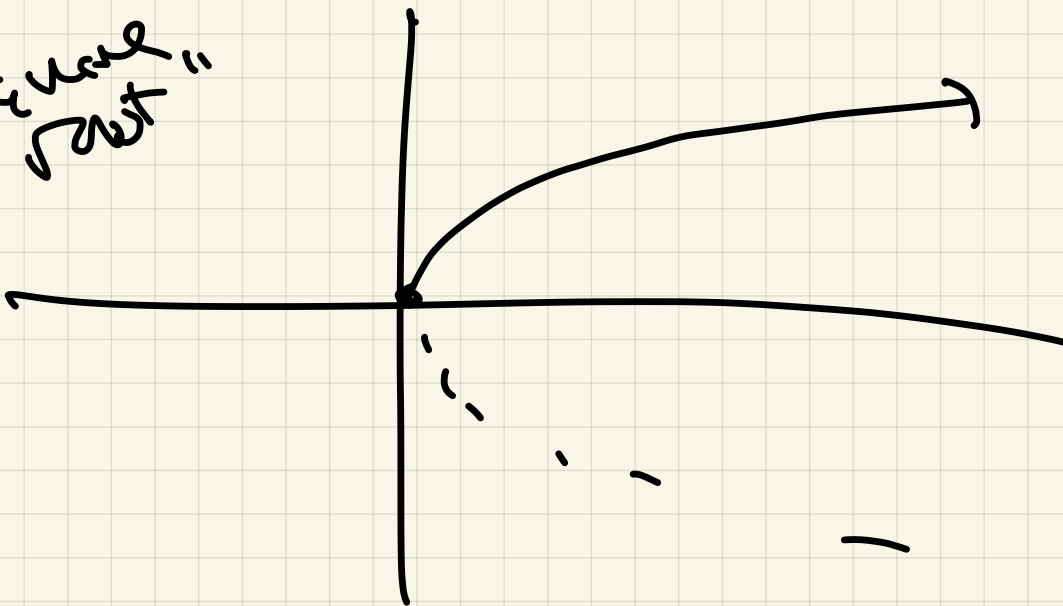


(D) $y = \sqrt{x}$

Domain = $[0, \infty)$

$y = \sqrt{x}$
 $y^2 = x$
 $x = y^2$

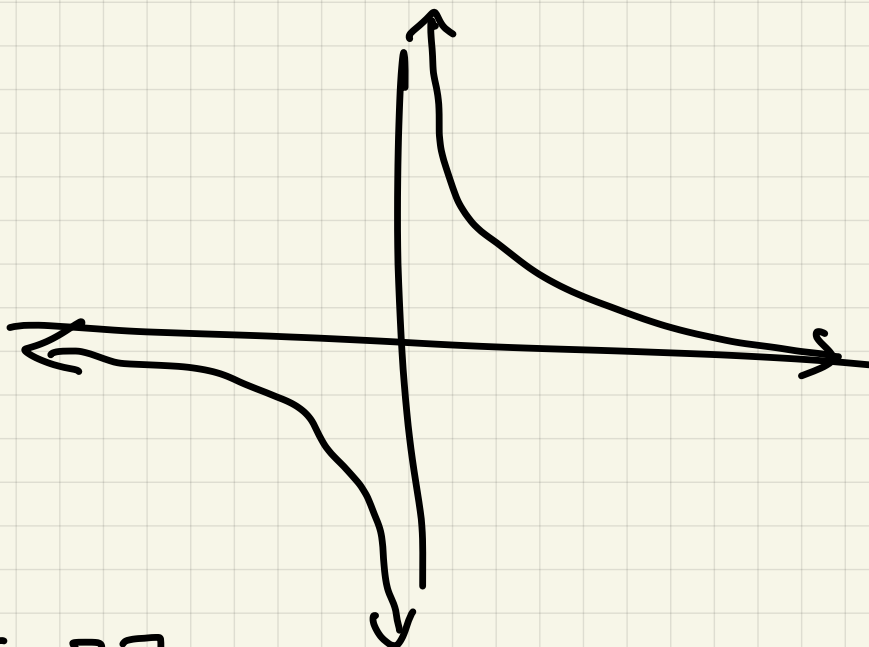
"square root"



(E)

$f(x) = \frac{1}{x}$ domain = $(-\infty, 0) \cup (0, \infty)$

Reciprocal



(F)

$$y = \lfloor x \rfloor =$$

"greatest integer, n such that
 $n \leq x$ "

Notation: $\lfloor x \rfloor = \text{floor function}$

ex 1: $\lfloor 5 \rfloor = 5$

$$\lfloor 20 \rfloor = 20$$

$$\lfloor -10 \rfloor = -10$$

$$\lfloor 1.7 \rfloor = 1$$

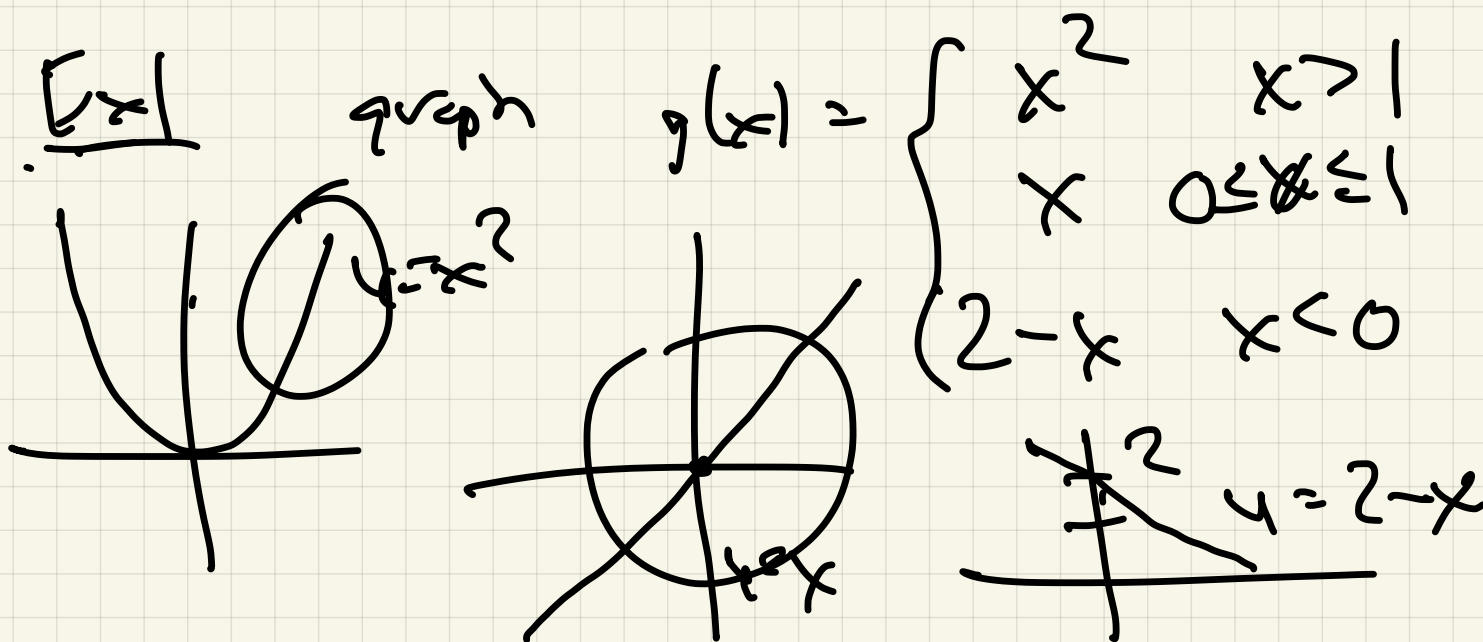
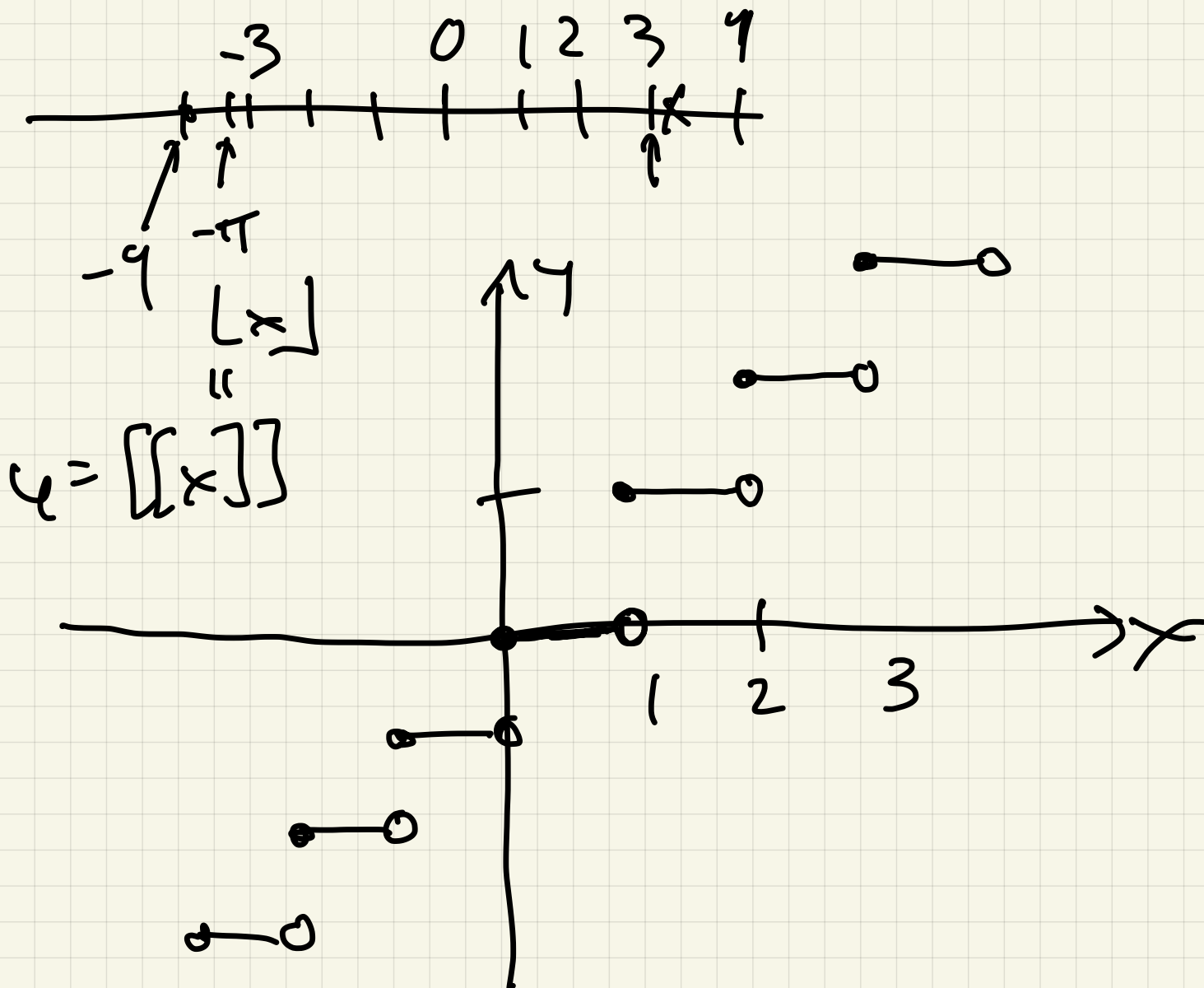
$$\lfloor 2.8 \rfloor = 2$$

$$\pi = 3.14159 \sim$$

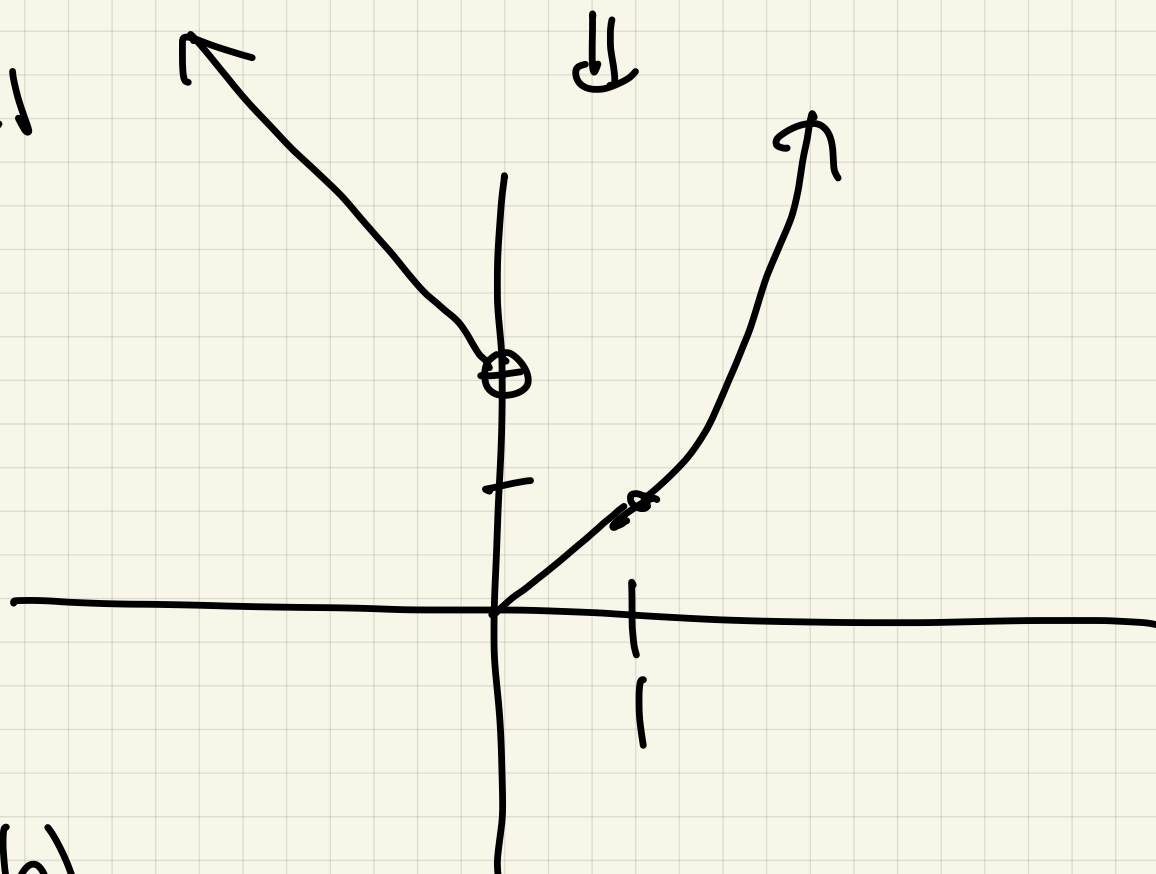
$$\lfloor 10.375 \rfloor = 10$$

$$\lfloor \pi \rfloor = 3$$

$$\lfloor -\pi \rfloor = -4$$

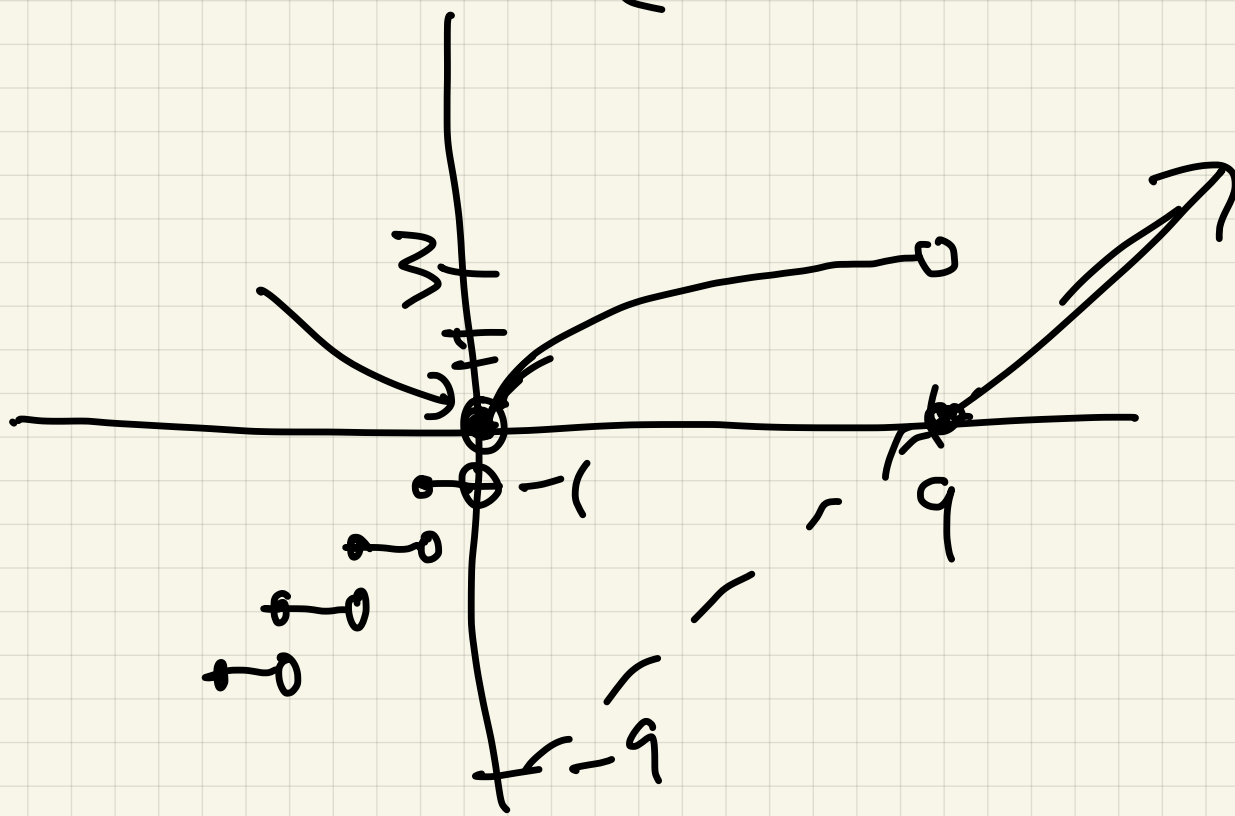


(a)



(b)

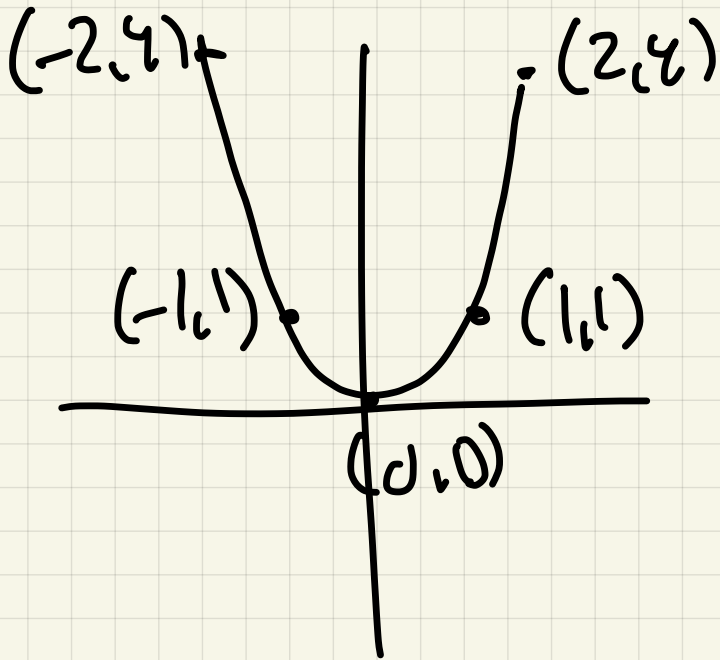
$$h(x) = \begin{cases} x - 9 & x \geq 9 \\ \sqrt{x} & 0 < x < 9 \\ \lfloor x \rfloor & x \leq 0 \end{cases}$$



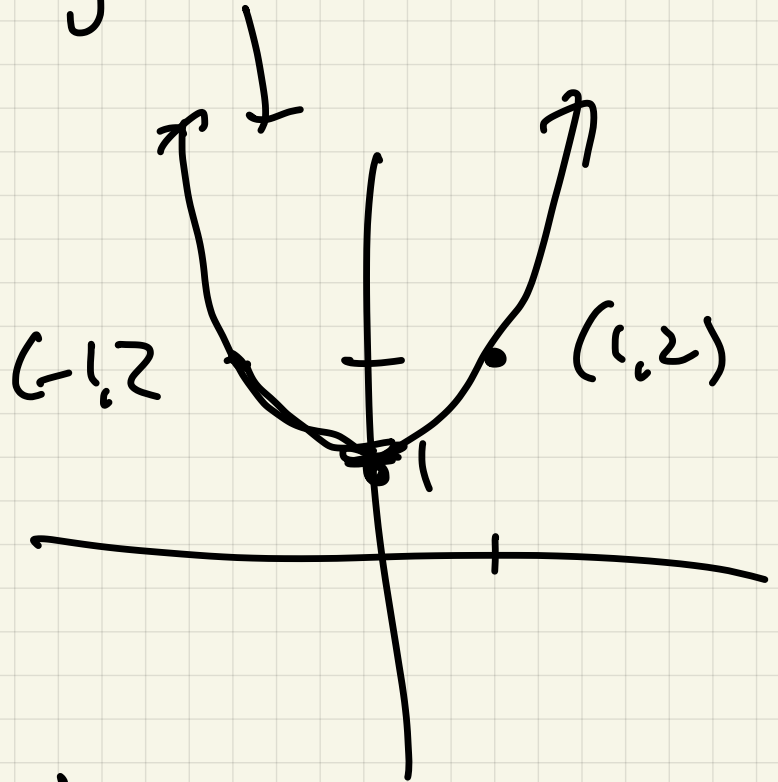
§2.5 Transforming graphs

Vertical shift:

$$y = x^2$$



$$y = x^2 + 1$$



Vertical shift:

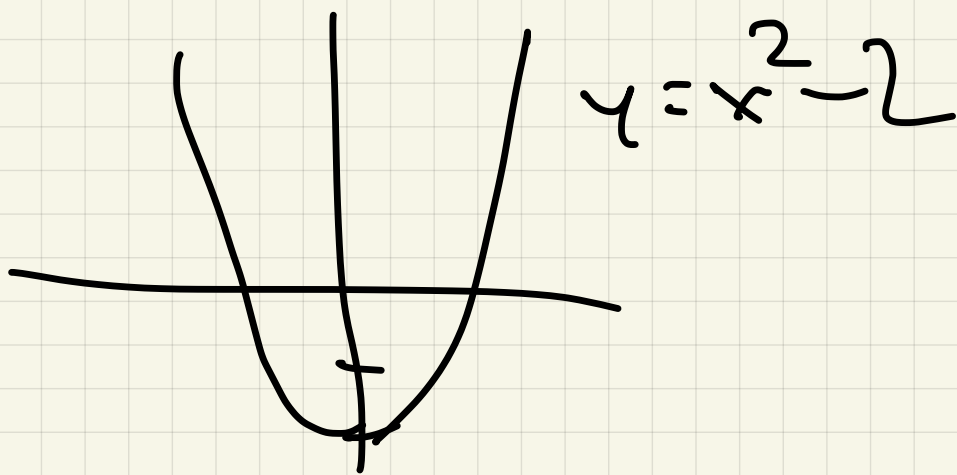
$$y = f(x), \quad c > 0$$

(a) $y = f(x) + c$

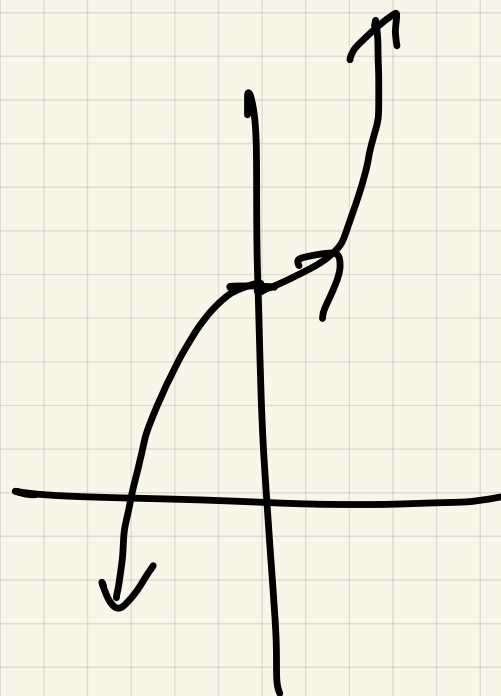
shift graph of f up c units

(b) $y = f(x) - c$

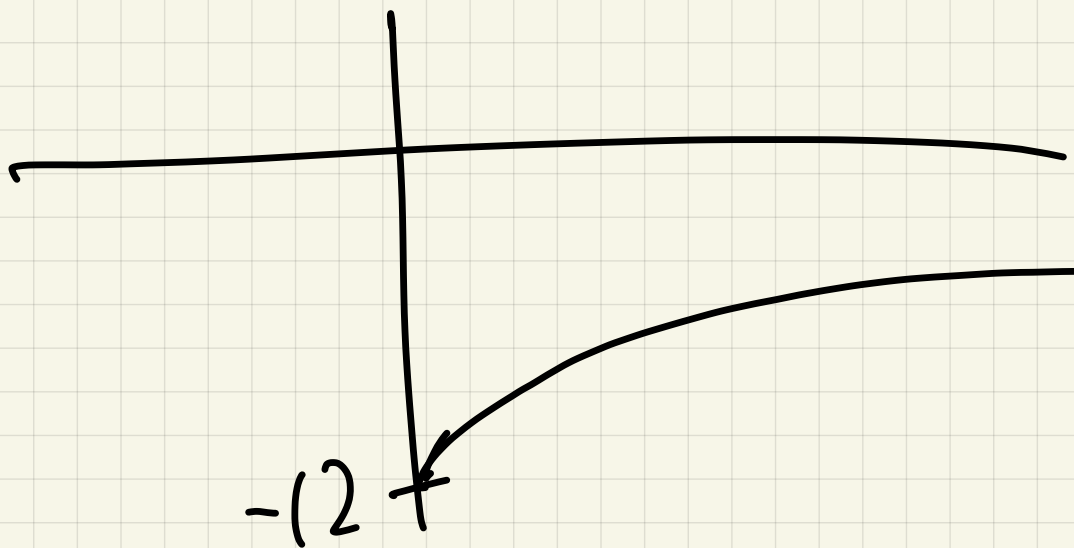
shifts graph down by c units



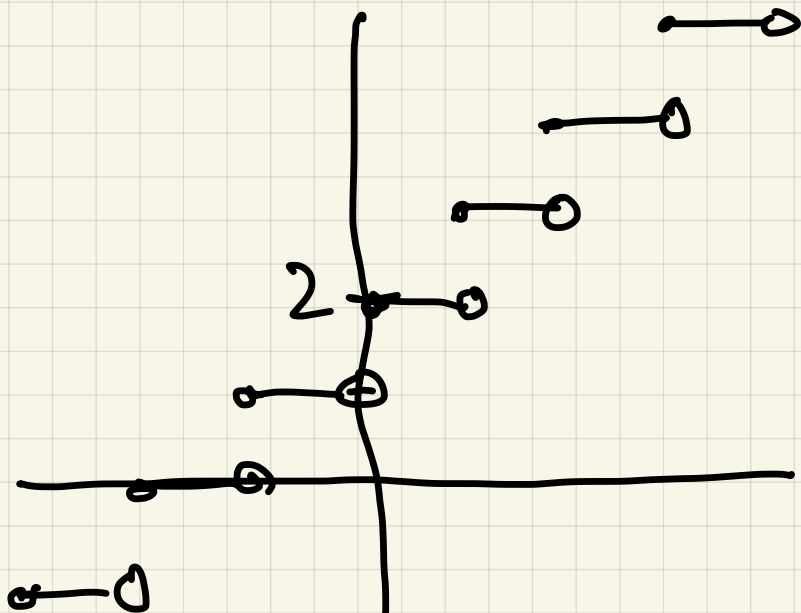
Ex 1 (a) $y = x^3 + 7$



(b) $y = \sqrt{x} - 12$



(c) $y = (\text{~~*~~}) + 2$



Horizontal shift $y = f(x)$, $c > 0$

(a) $h(x) = f(x-c)$ shifts graph

c units to right

(b) $h(x) = f(x+c)$ shifts graph

c units left

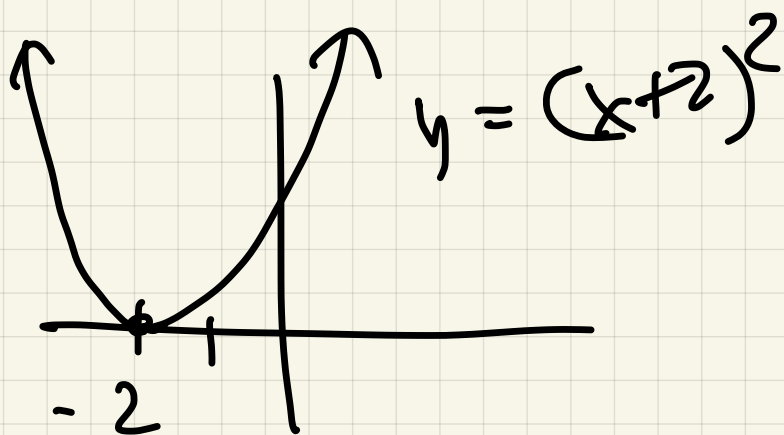
Ex 8

(a)

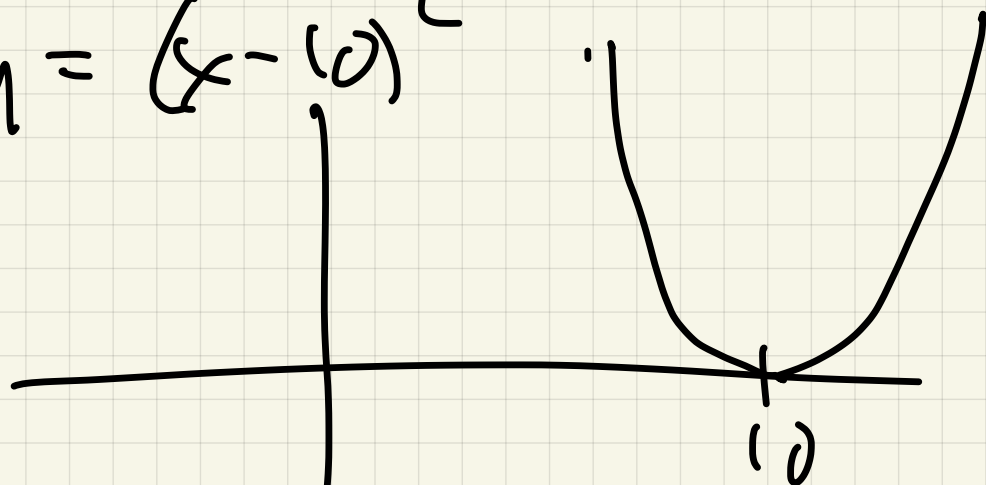


(b)

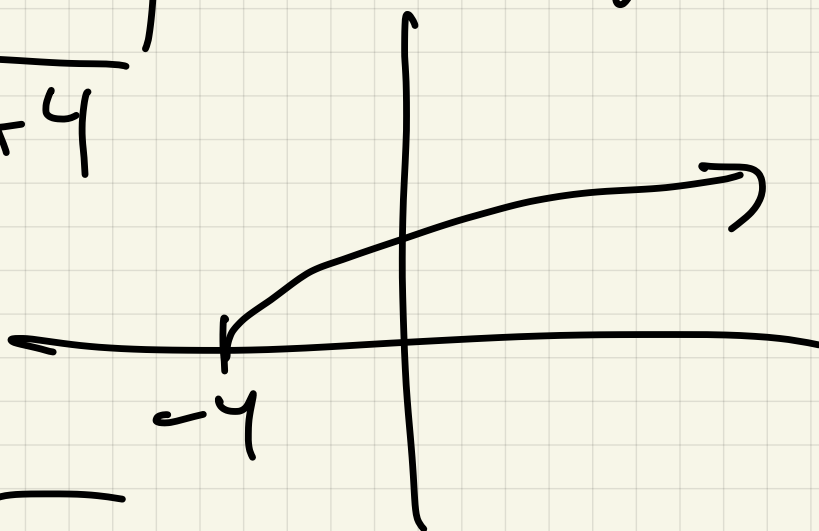
$$y = (x+2)^2$$



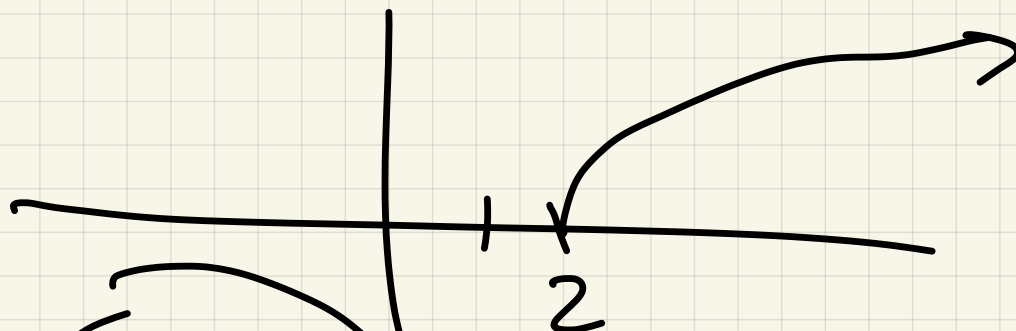
(c) $y = (x - (0))^2$



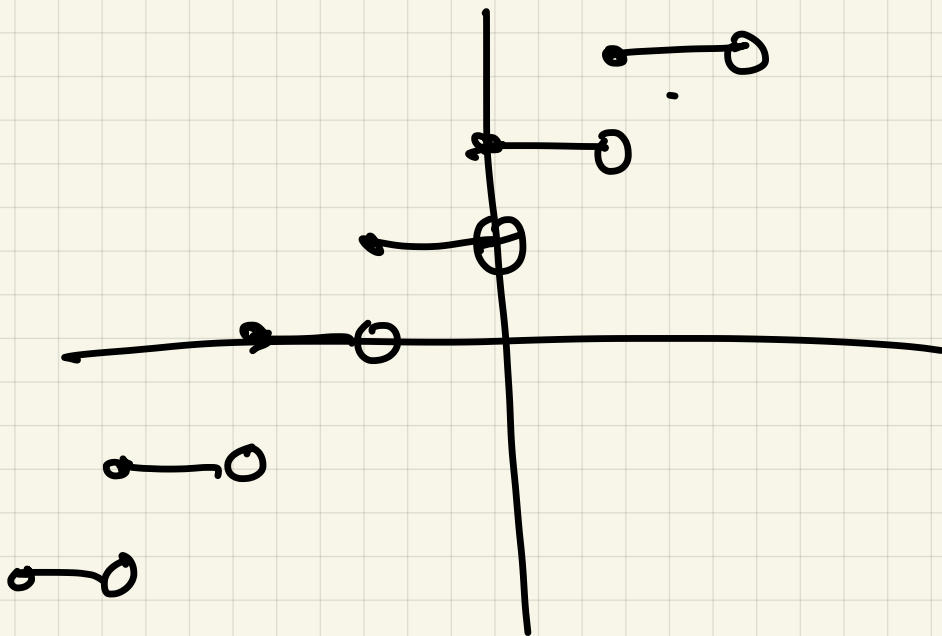
(d) $y = \sqrt{x+4}$



(e) $y = \sqrt{x-2}$



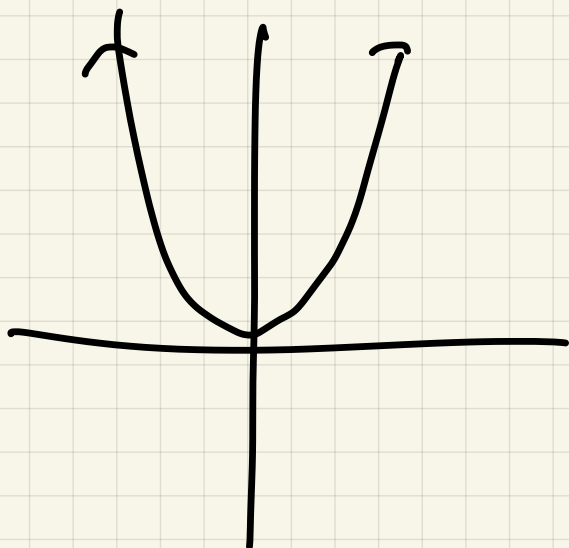
(f) $y = \sqrt{x+2}$



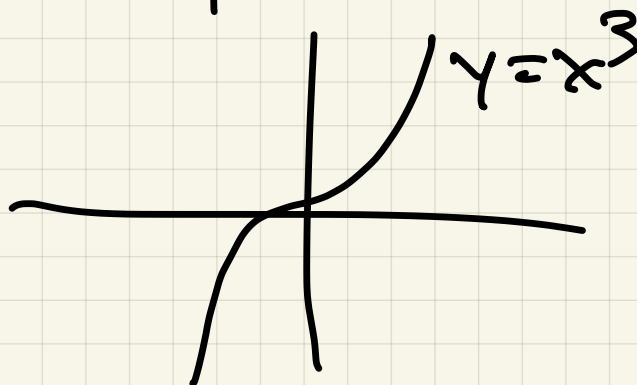
Combine shifts

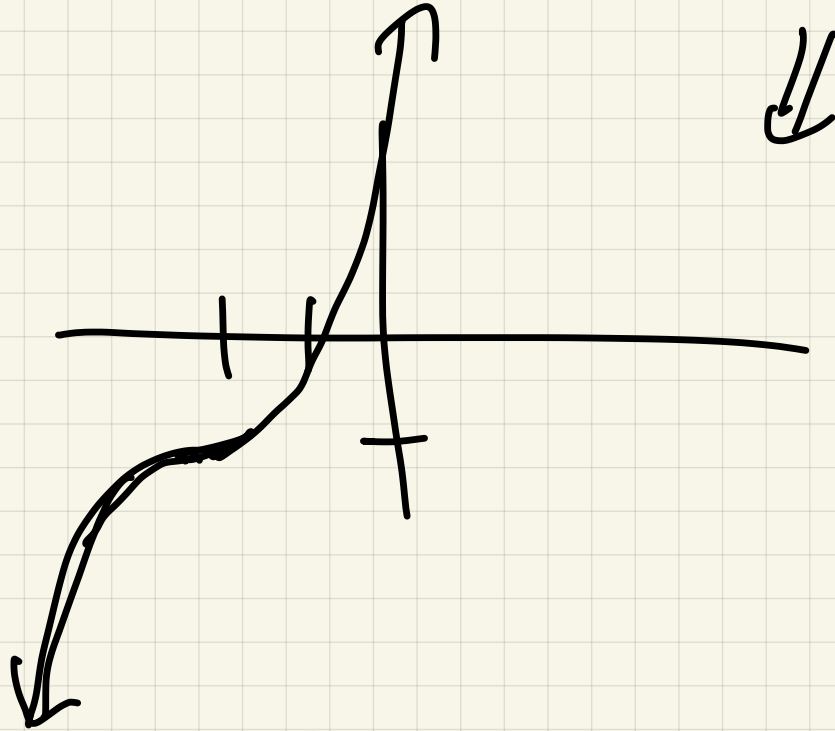
(a) $y = (x-4)^2 - 1$

shift 4 units right
shift down 1 unit

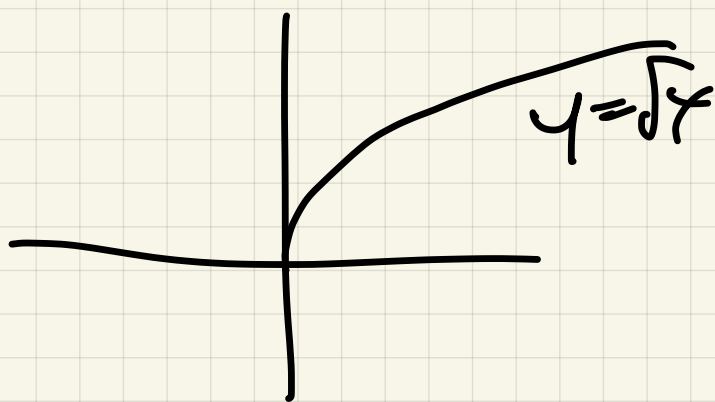


(b) $y = (\underline{x+2})^3 - 1$

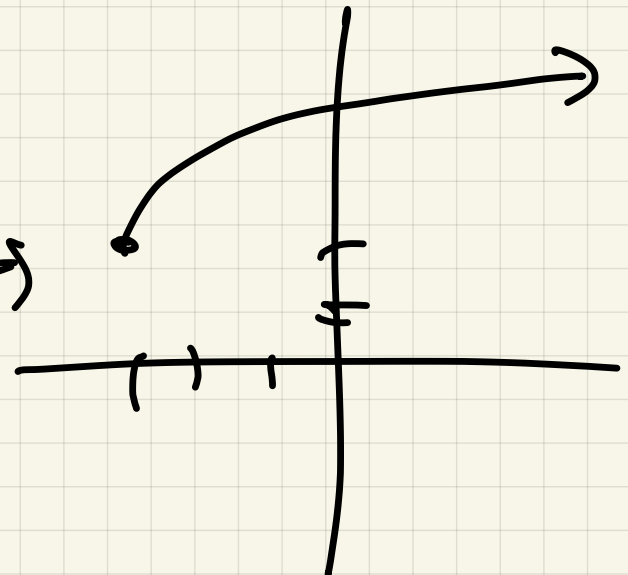




(c) $y = \sqrt{x+3} + 2$



$y = \sqrt{x}$



Reflections

$y = f(x)$ graph

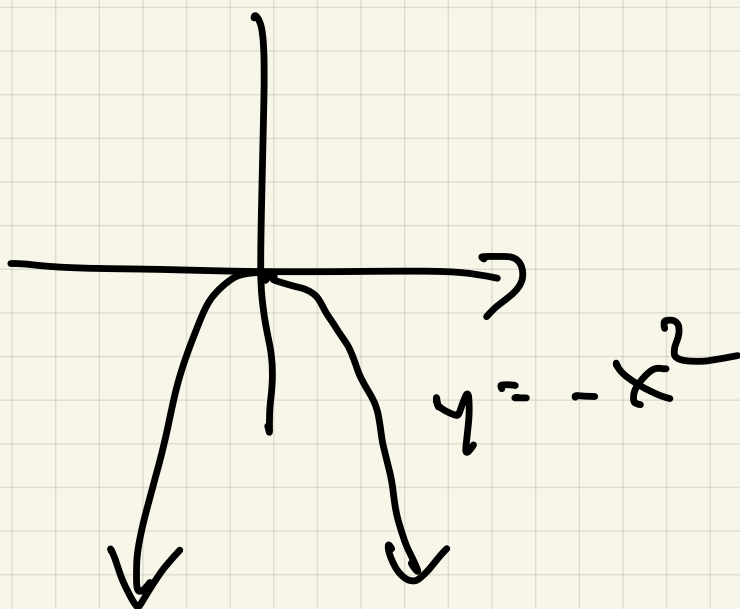
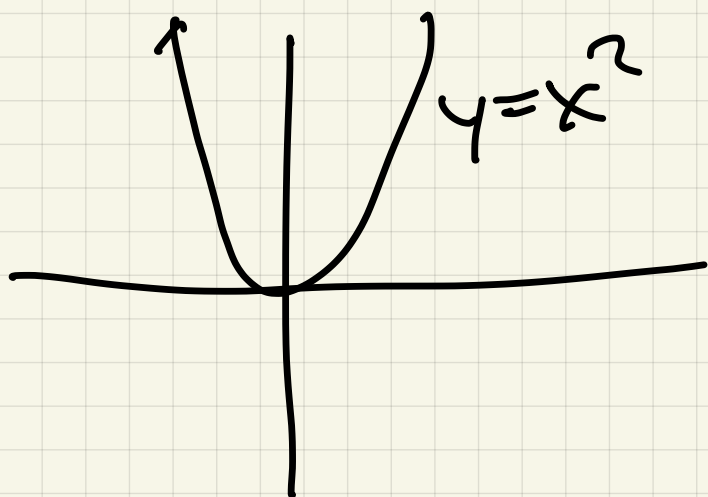
① Reflection about x-axis

given by $y = -f(x)$

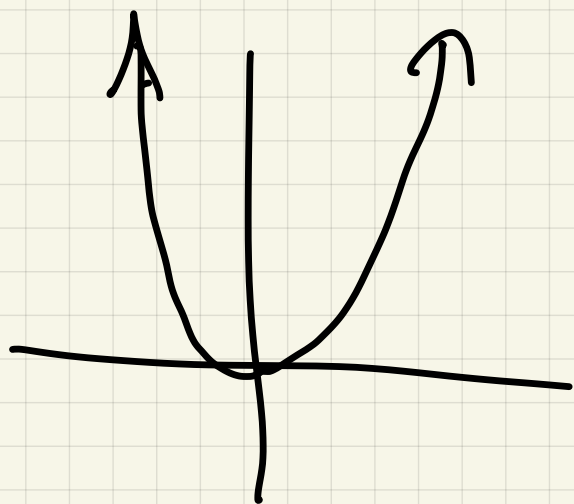
② Reflection about y-axis

given by $y = f(-x)$

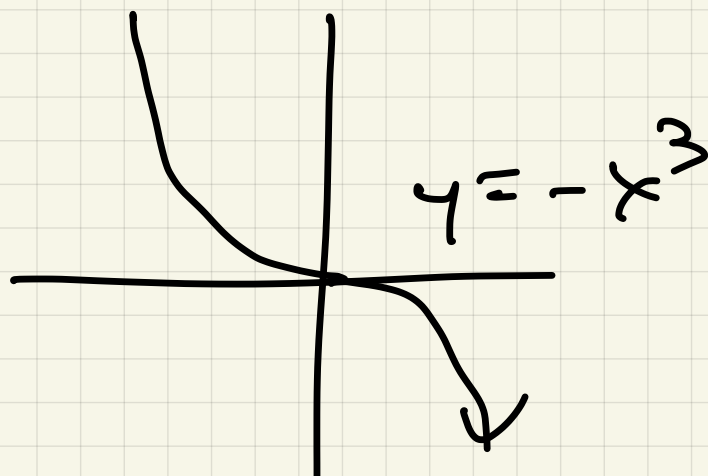
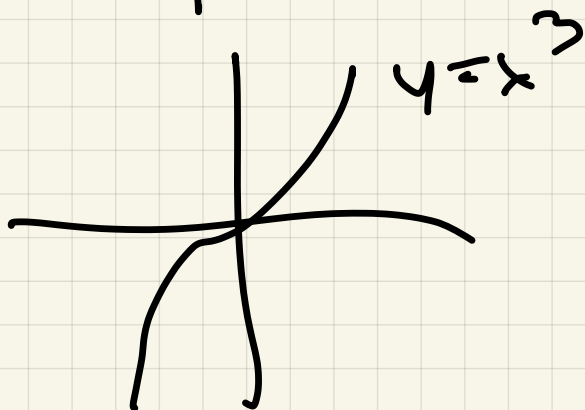
Ex 4 (a) $y = -x^2$

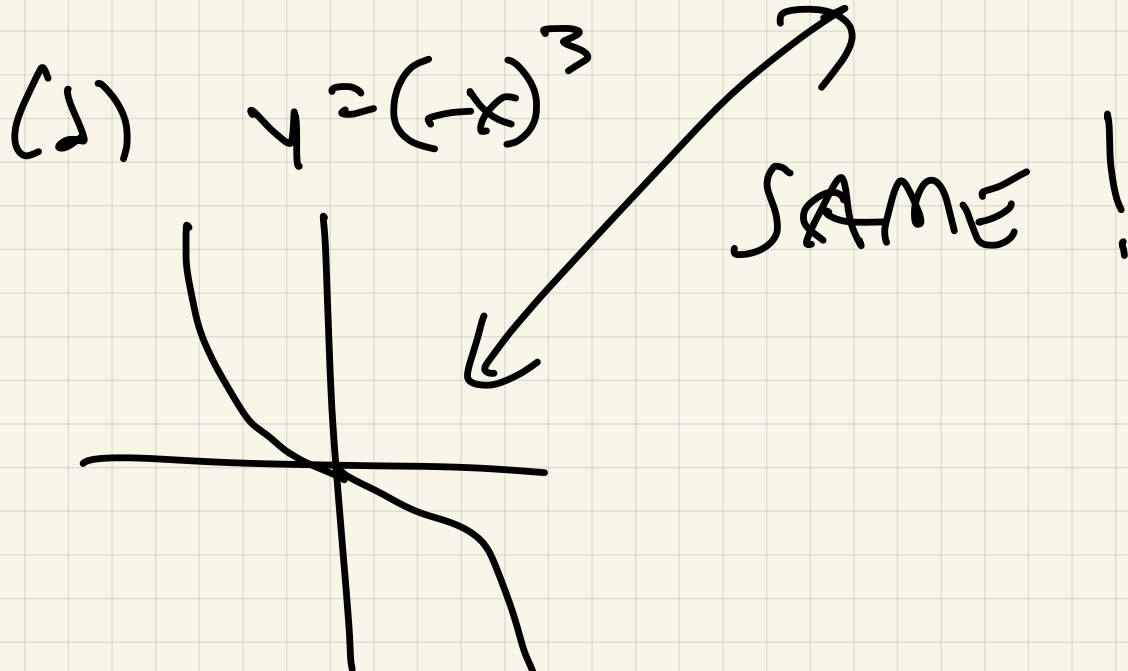


(b) $y = (-x)^2$

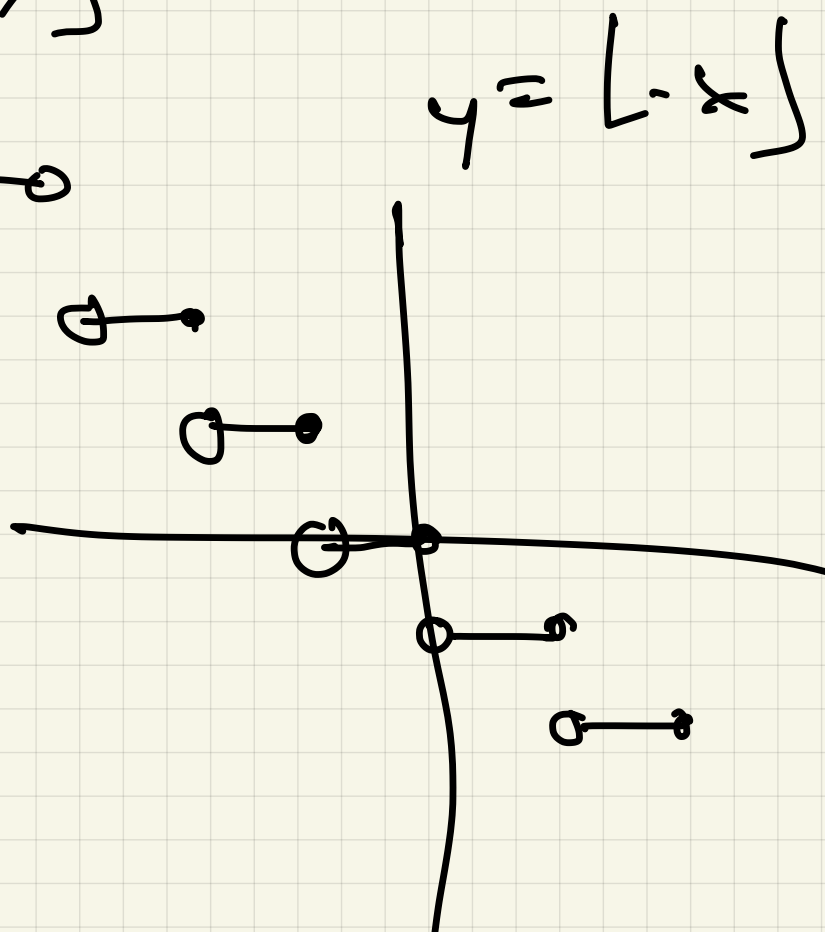
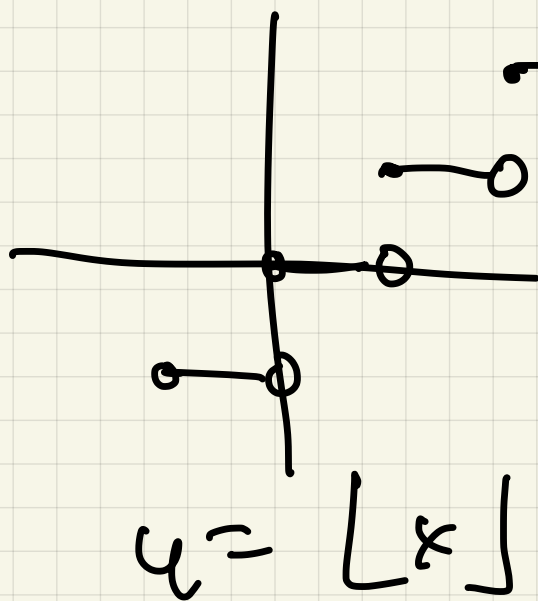


(c) $y = -x^3$



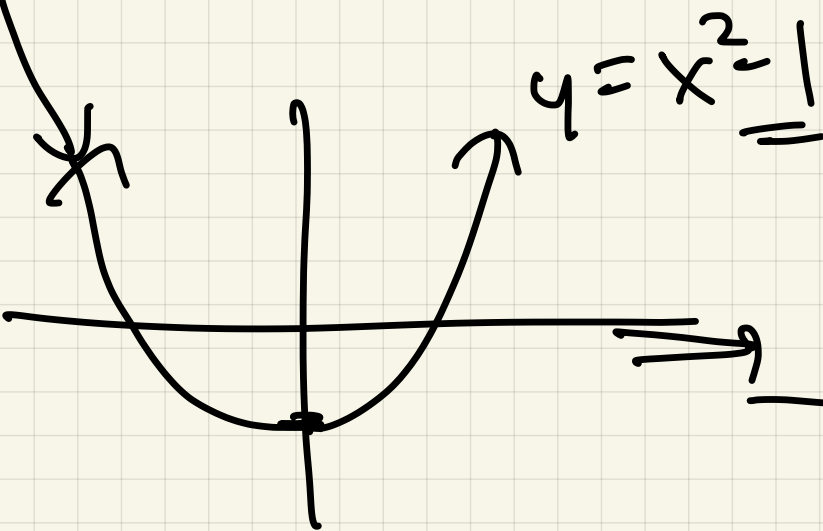
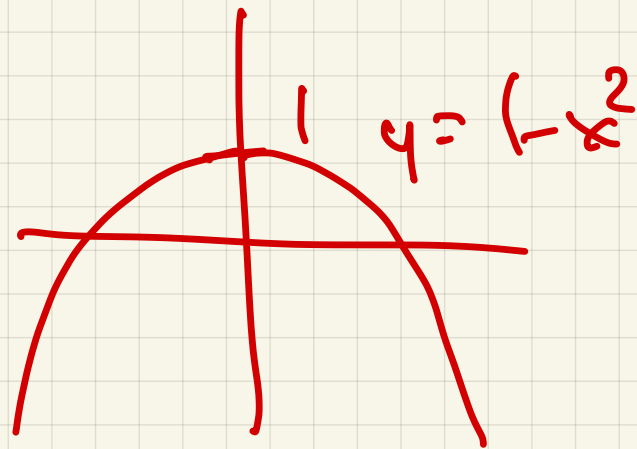
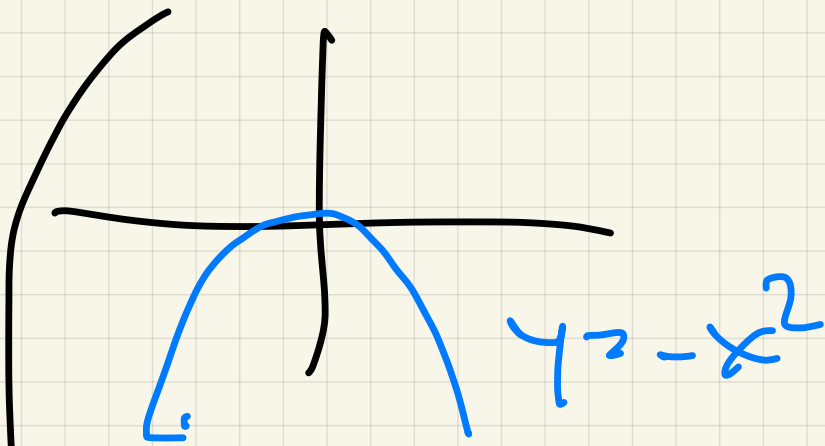


(2) $y = \lfloor -x \rfloor$

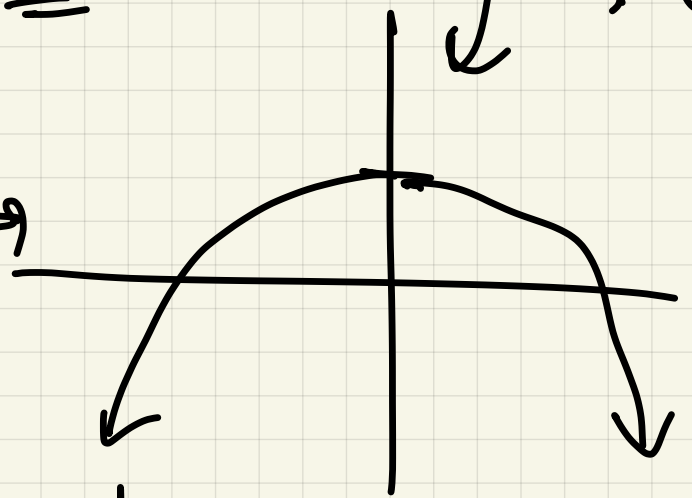


Ex 5

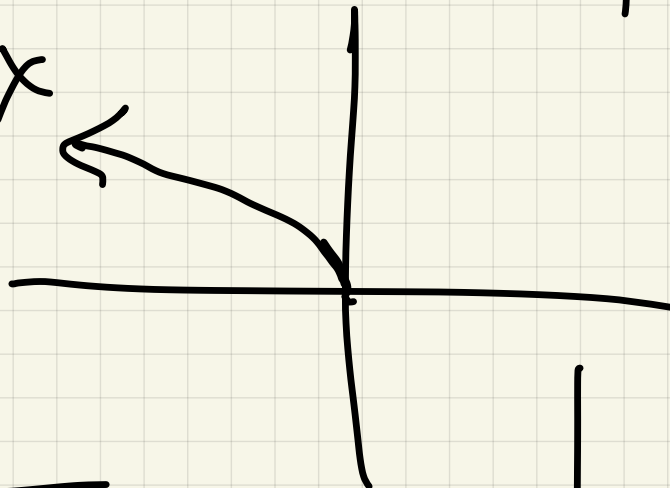
(a) $y = 1 - x^2 = -(x^2 - 1)$



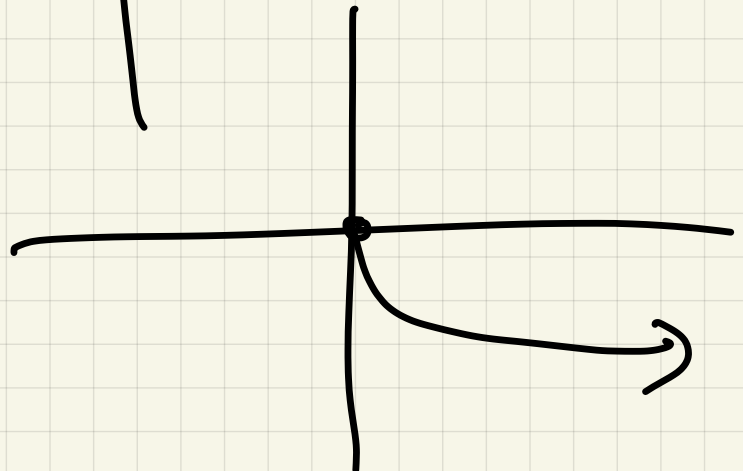
same!



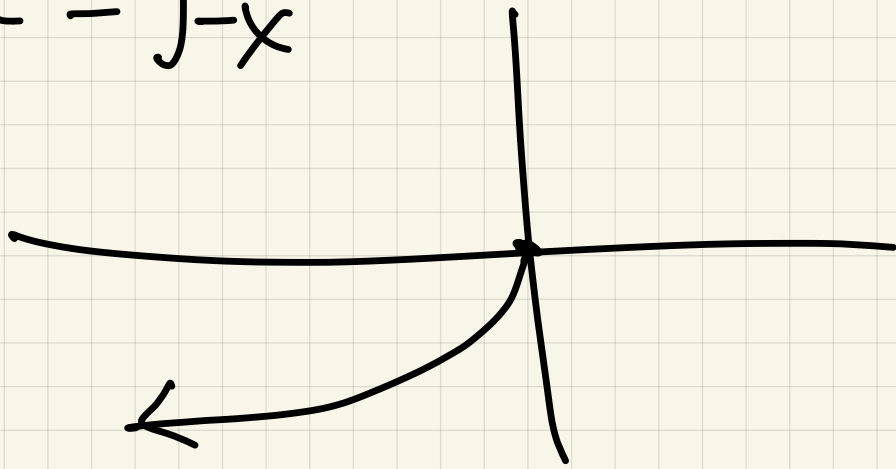
(c) $y = \sqrt{-x}$



(d) $y = \sqrt{x}$

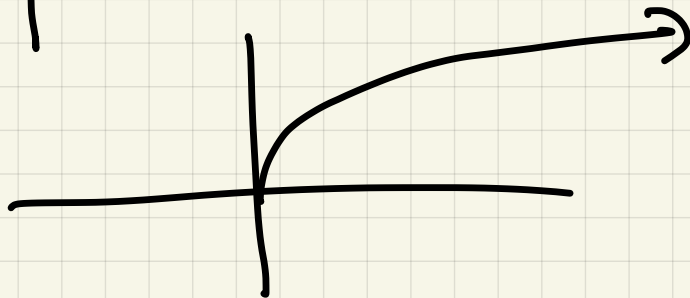


(eff) $y = -\sqrt{-x}$

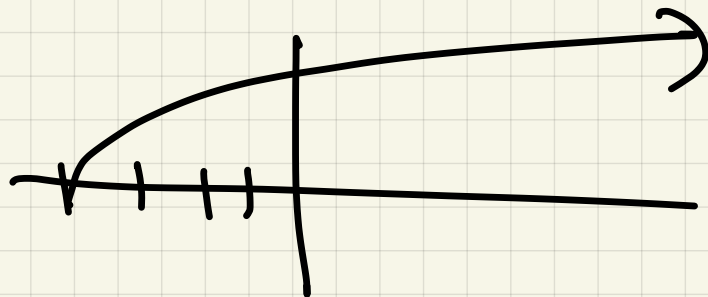


(1) $y = 2\sqrt{x+4}$

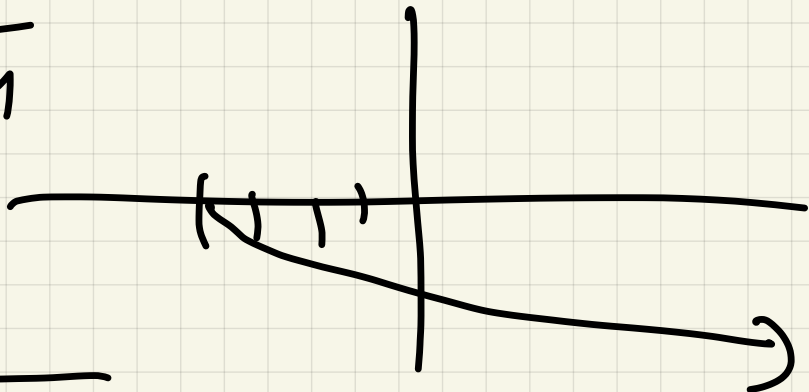
$y = \sqrt{x}$



$y = \sqrt{x+4}$



$y = -\sqrt{x+4}$



$y = 2 - \sqrt{x+4}$

