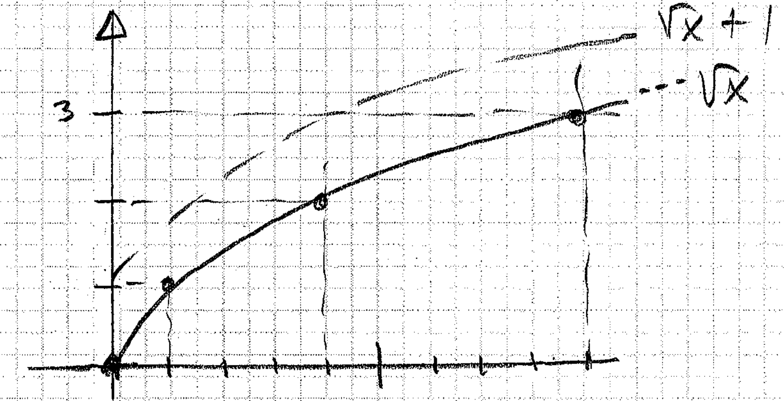
TRANSFORMATIONS

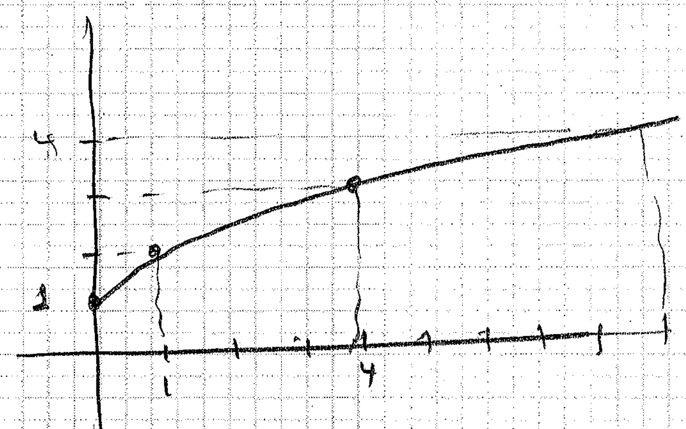
$$y = \sqrt{x}$$

x	$\sqrt{x}$
0	0
1	1
4	2
9	3



$$y = \sqrt{x} + 1$$

x	$\sqrt{x} + 1$
0	1
1	2
4	3
9	4



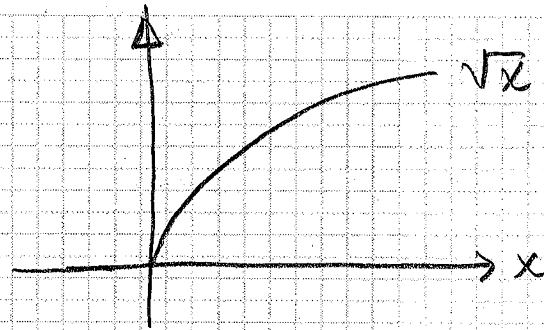
$$\boxed{\begin{array}{l} f(x) \longrightarrow f(x) + a \\ f(x) \longrightarrow f(x) - a \end{array}}$$

shift up of a units

" down " " "

$y = \sqrt{x}$

x	$\sqrt{x}$
0	0
1	1
4	2
9	3



$y = \sqrt{x+2}$

x	$x+2$	$\sqrt{x+2}$
-2	0	0
-1	1	1
2	4	2
7	9	3

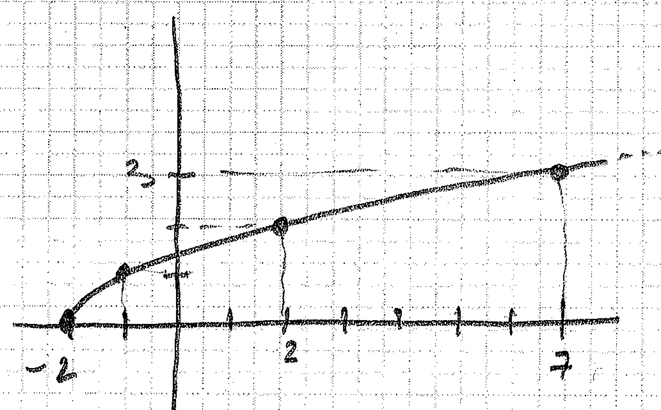
$x+2=0 \Rightarrow x=-2$

$x+2=1 \Rightarrow x=-1$

$x+2=4 \Rightarrow x=4-2=2$

$x+2=9 \Rightarrow x=9-2=7$

shif to the left of 2 units

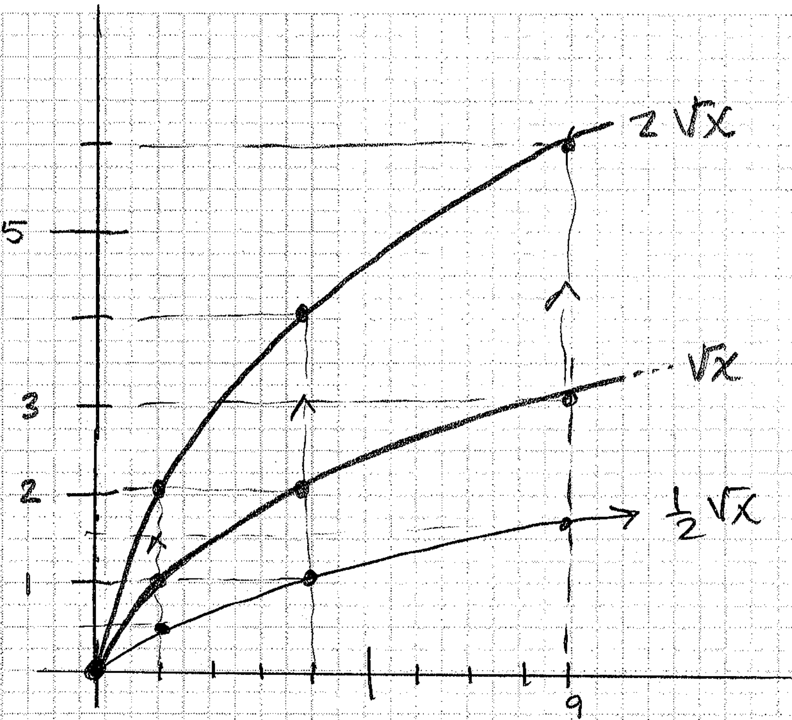


$f(x) \longrightarrow f(x+a)$ shifted left a units

$f(x) \longrightarrow f(x-a)$ " right " "

$f(x) = \sqrt{x}$

x	$\sqrt{x}$	$2\sqrt{x}$	$\frac{1}{2}\sqrt{x}$
0	0	0	0
1	1	2	$\frac{1}{2}$
4	2	4	1
9	3	6	$3/2 = 1.5$



$f(x) = 2\sqrt{x}$ vertical stretch

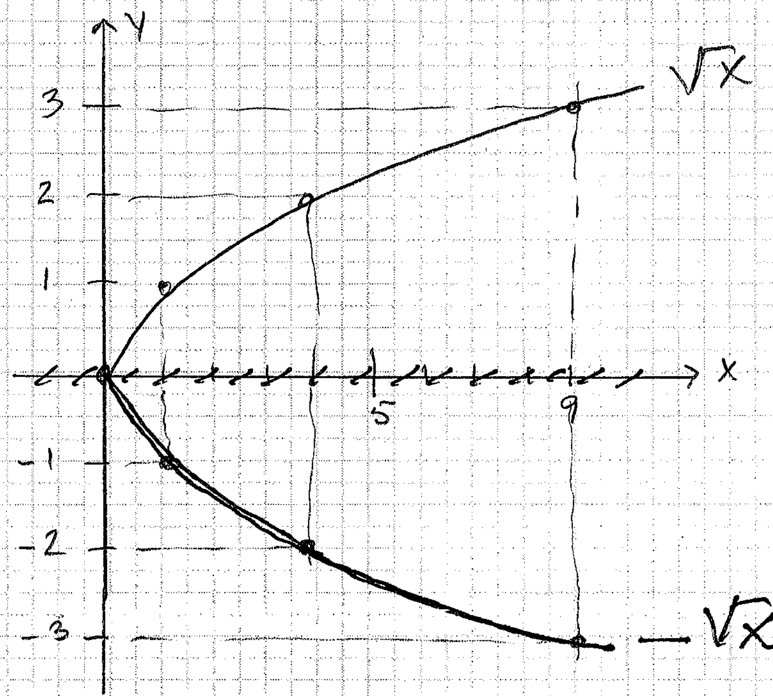
$f(x) = \frac{1}{2}\sqrt{x}$ " compression

$f(x) \longrightarrow a\sqrt{x}$ vertical stretch $a > 1$

$a\sqrt{x}$ " compression $0 < a < 1$

$f(x) = \sqrt{x}$

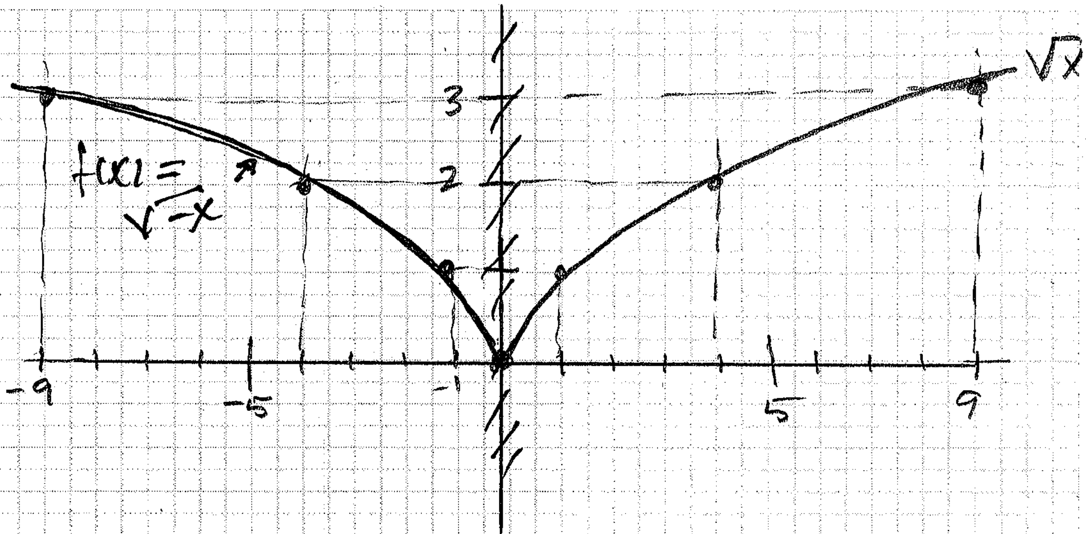
x	$\sqrt{x}$	$-\sqrt{x}$
0	0	0
1	1	-1
4	2	-2
9	3	-3



$f(x) = -\sqrt{x}$ reflection on the x-axis

$f(x) = \sqrt{x}$

x	$\sqrt{x}$
0	0
1	1
4	2
9	3



$f(x) = \sqrt{-x}$ reflection on the y-axis

x	$-x$	$\sqrt{-x}$
0	0	0
-1	1	1
-4	4	2
-9	9	3

$-x = 1 \Rightarrow x = -1$

$-x = 4 \Rightarrow x = -4$

$-x = 9 \Rightarrow x = -9$

$\boxed{f(x) \longrightarrow f(-x) \text{ reflection on the y-axis}}$