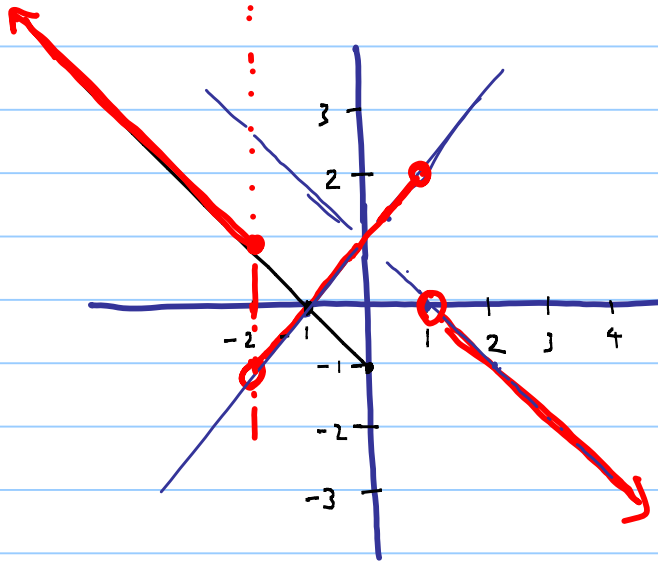
September 20, 2010

Note Title 9/20/2010

§3.2 #66

$$f(x) = \begin{cases} -x-1 & x \le -2 \\ x+1 & -2 < x < 1 \\ -x+1 & x > 1 \end{cases}$$

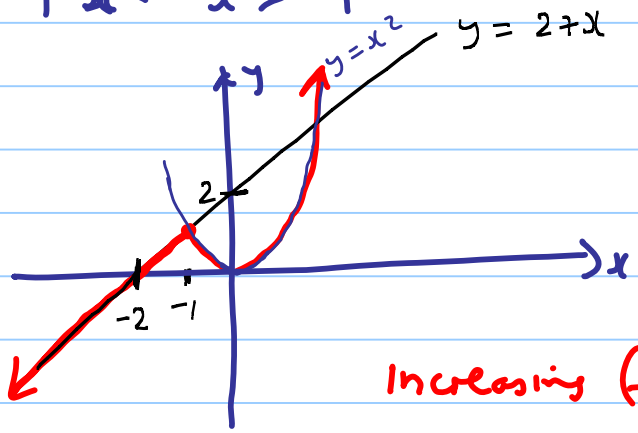


Domain:
$(-\infty, -2] \cup (-2, 1) \cup (1, \infty)$
i.e. $(-\infty, 1) \cup (1, \infty)$

Range:
$(-\infty, \infty)$

#69

$$f(x) = \begin{cases} 2+x & x \le -1 \\ x^2 & x > -1 \end{cases}$$



Increasing $(-\infty, -1) \cup (0, \infty)$

Graphing Techniques

Consider the functions $f(x) = |x|$

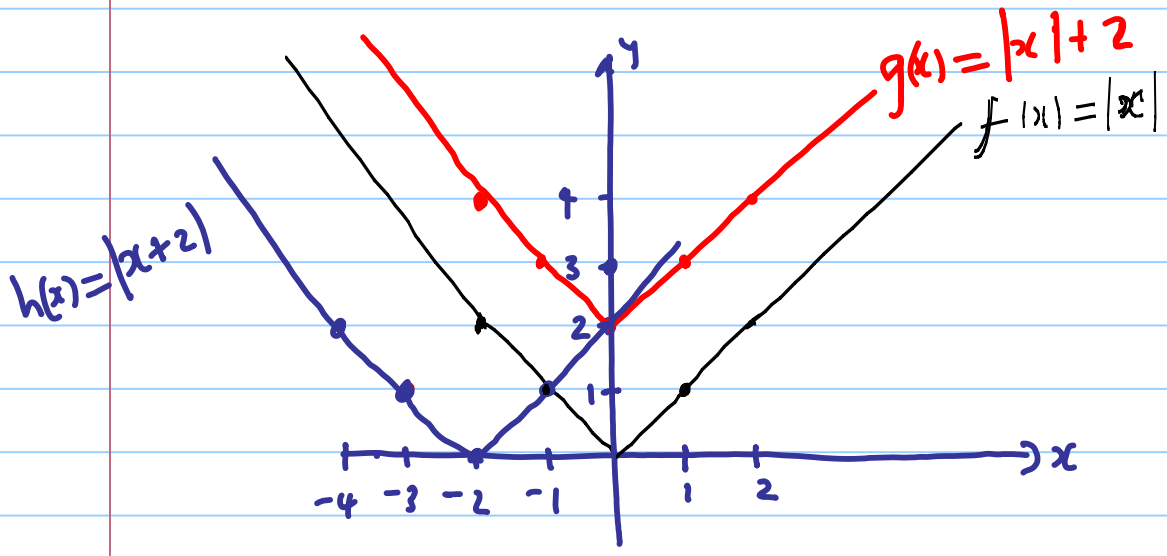
$g(x) = |x| + 2$

$h(x) = |x + 2|$

we want the graphs of the three functions.

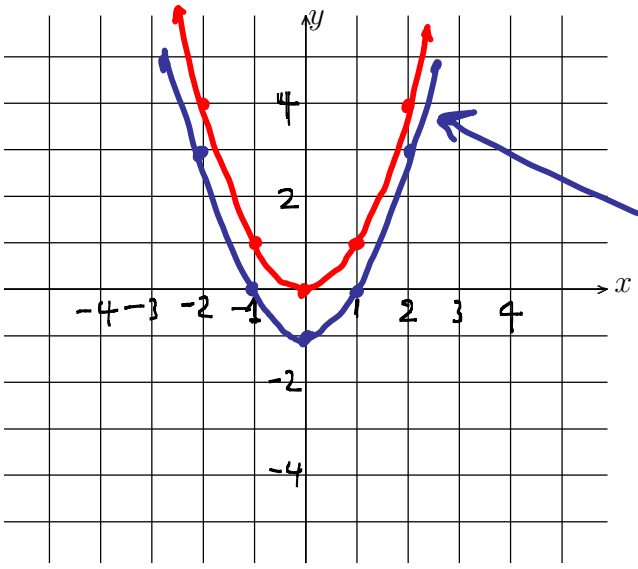
$h(-3) = |-3+2|$

x	$f(x) = \lvert x \rvert$	x	$g(x) = \lvert x \rvert + 2$	x	$h(x) = \lvert x+2 \rvert$
				-3	1
-2	2	-2	4	-2	0
-1	1	-1	3	-1	1
0	0	0	2	0	2
1	1	1	3	1	3
2	2	2	4	2	4



September 20, 2010 - Section 3.3

$g(x) = x^2 - 1$



Start with

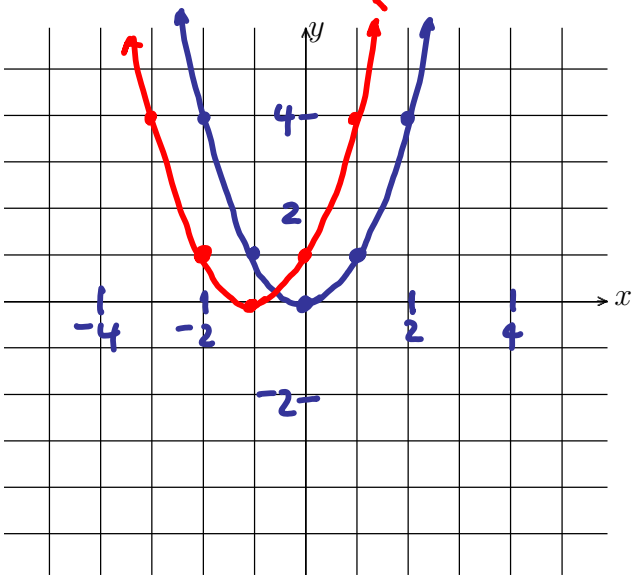
$f(x) = x^2$

$g(x) = f(x) - 1$

vertical shift

1 unit downwards

$H(x) = (x+1)^2$



$H(x) = (x+1)^2$

Start with

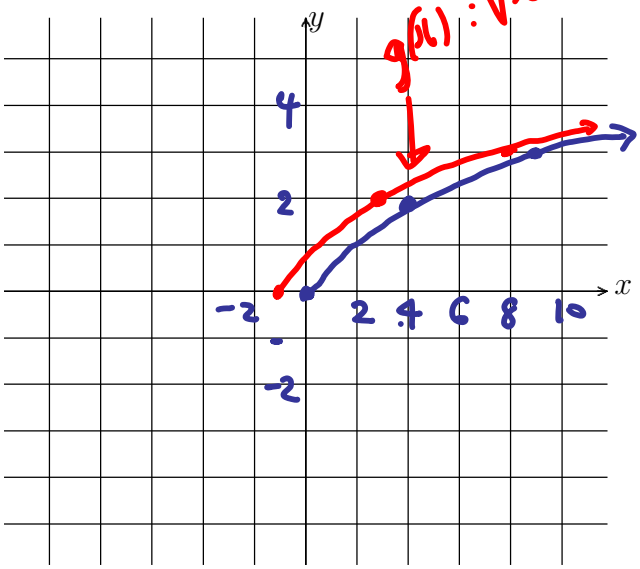
$f(x) = x^2$

$H(x) = (x+1)^2$

Horizontal shift

1 unit to the left

$g(x) = \sqrt{x+1}$



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

Domain: $[0, \infty)$

Range $[0, \infty)$

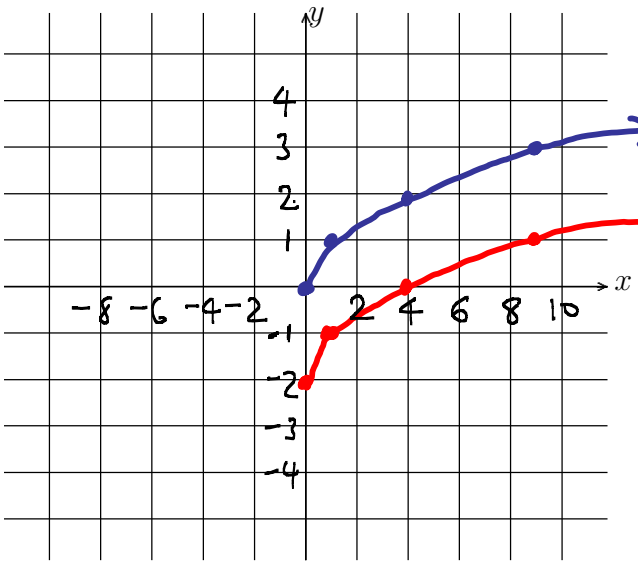
$g(x) = f(x+1)$

Horizontal 1 unit to the left.

Domain: $[-1, \infty)$

Range: $[0, \infty)$

$G(x) = \sqrt{x} - 2$



Start with $f(x) = \sqrt{x}$ D: $[0, \infty)$ R: $[0, \infty)$

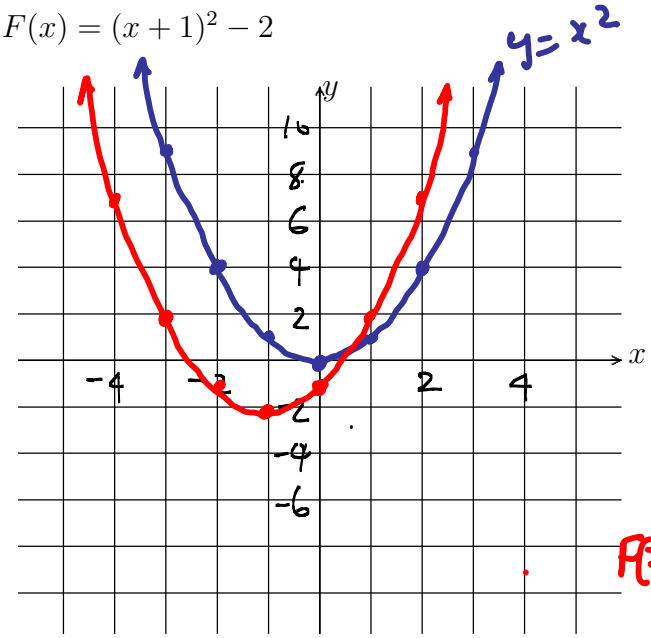
$G(x) = f(x) - 2$

vertical shift 2 units down

Domain: $[0, \infty)$

Range: $[-2, \infty)$

$F(x) = (x+1)^2 - 2$



base function:

$g(x) = x^2$

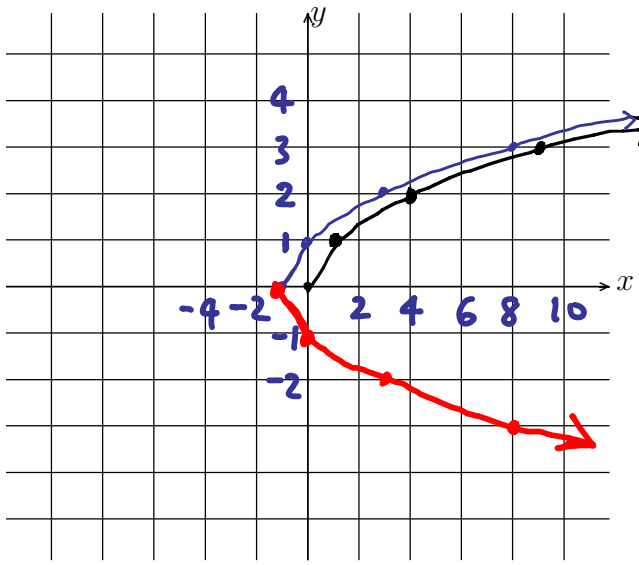
$g(x+1) = (x+1)^2$

Horizontal shift 1 unit to the left.

$F(x) = g(x+1) - 2 = (x+1)^2 - 2$

Vertical shift 2 units down.

$G(x) = -\sqrt{x+1}$



base function: $f(x) = \sqrt{x}$ $D: [0, \infty)$ $R: [0, \infty)$

$f(x+1) = \sqrt{x+1}$

Horizontal shift 1 unit to the left.

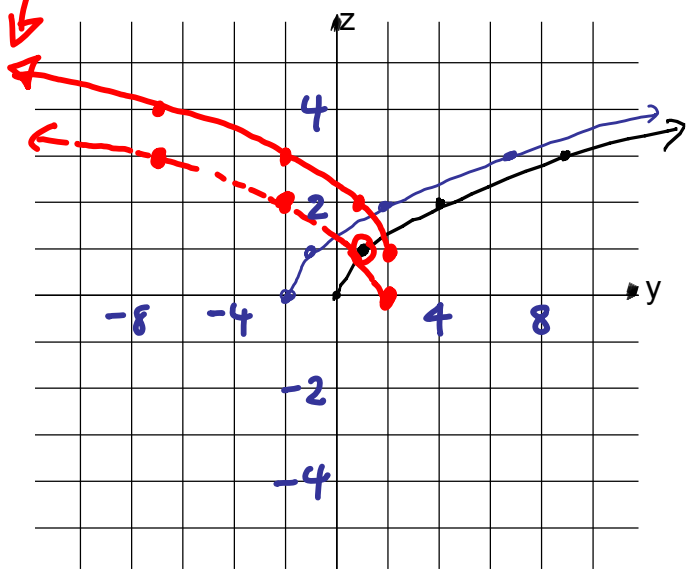
$-f(x+1) = -\sqrt{x+1}$

Reflection on the x-axis.

Domain: $[-1, \infty)$

Range: $(-\infty, 0]$

g)y* > $\sqrt{3-y}$, 2



base function:

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

$g(x+2) = \sqrt{x+2}$

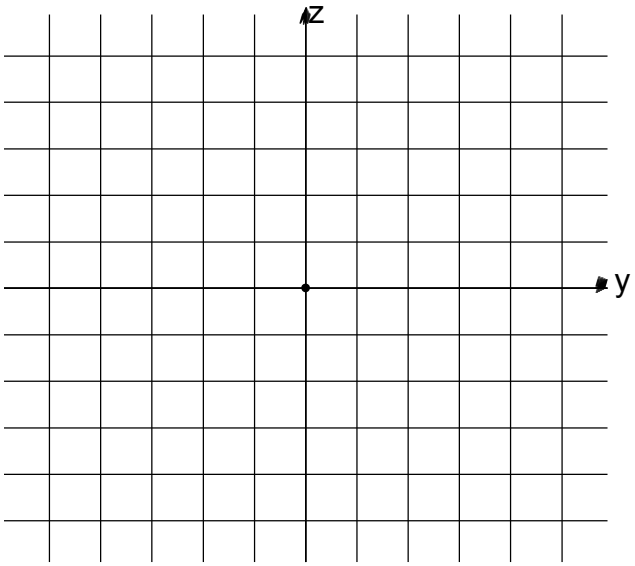
Horizontal shift 2 units to the left.

$g(-x+2) = \sqrt{-x+2}$

$= \sqrt{2-x}$

Reflection on the y-axis

$g(-x+2)+1 = \sqrt{2-x} + 1$



vertical shift 1 unit upwards.

Domain: $(-\infty, 2]$

Range: $[1, \infty)$