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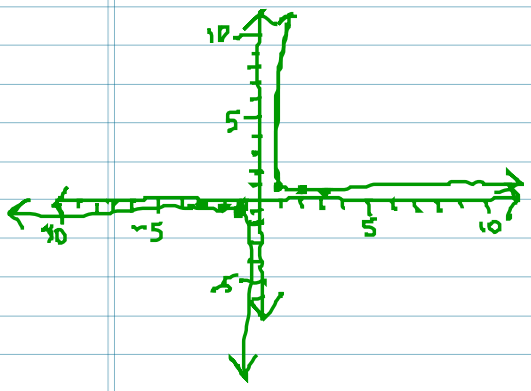
> Thursday Library of Function Quiz
- CAN NOT use NOTES

- NEED TO KNOW ALL 8 Library functions:

1 * Constant function
2 * identity function
3 * Square function
4 * Square Root function
5 * cube function
6 * cube Root function
7 * Absolute value function
8 * Reciprocal function.

Ex: Sample thurs. Quiz



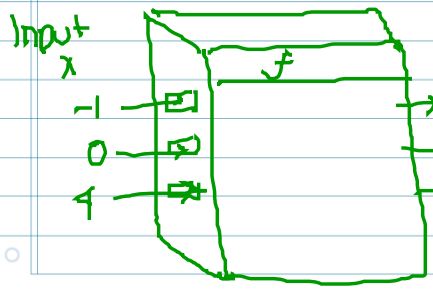
Graph the reciprocal function $f(x) = \frac{1}{x}$

x	$f(x)=\frac{1}{x}$	y	
-1		-1	(-1, -1)
-2	$-\frac{1}{2}$	$-\frac{1}{2}$	$(-2, -\frac{1}{2})$
-3	$-\frac{1}{3}$	$-\frac{1}{3}$	$(-3, -\frac{1}{3})$
1	$\frac{1}{1}$	1	(1, 1)
2	$\frac{1}{2}$	$\frac{1}{2}$	$(2, \frac{1}{2})$
3	$\frac{1}{3}$	$\frac{1}{3}$	$(3, \frac{1}{3})$

Piecewise-Defined functions

(17)

$$f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ 2 & \text{if } x = 0 \\ 3x+4 & \text{if } x > 0 \end{cases}$$



$f(-1) = (-1)^2 = 1$ (-1, 1)

$f(0) = 2$ (0, 2)

$f(4) = 3(4) + 4 = 16$ (4, 16)

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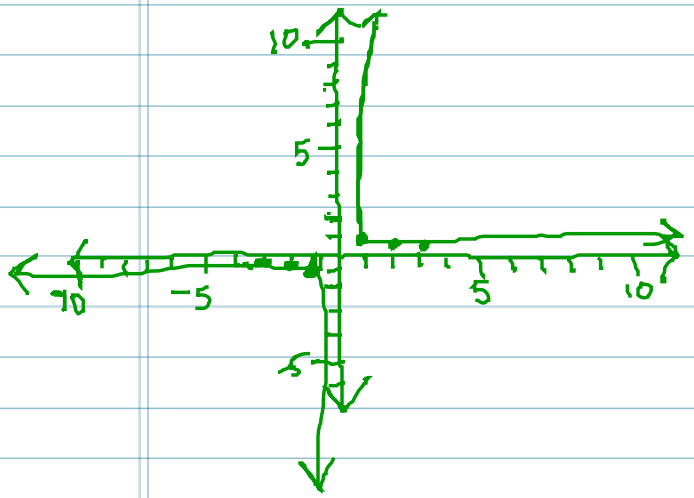

Graph the reciprocal function $f(x) = \frac{1}{x}$

x	$f(x)=\frac{1}{x}$	y
-1		-1 $(-1,-1)$
-2	$-\frac{1}{2}$	$-\frac{1}{2}$ $(-2,-\frac{1}{2})$
-3	$-\frac{1}{3}$	$-\frac{1}{3}$ $(-3,-\frac{1}{3})$
1	$\frac{1}{1}$	1 $(1,1)$
2	$\frac{1}{2}$	$\frac{1}{2}$ $(2,\frac{1}{2})$
3	$\frac{1}{3}$	$\frac{1}{3}$ $(3,\frac{1}{3})$

Piecewise-Defined functions

(17)

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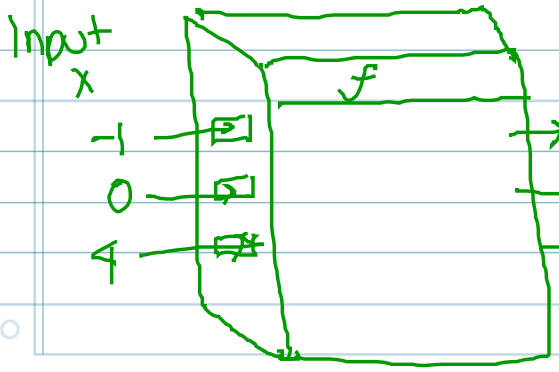


$f(-1) = (-1)^2 = 1$ $(-1, 1)$

$f(0) = 2$ $(0, 2)$

$f(4) = 3(4)+4 = 16$ $(4, 16)$

$$f(x) = \begin{cases} 4 - x & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$$

21 & 22 To graph

$$f(x) \begin{cases} 4 - x & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$$

$<>$ open dot

$\leq \geq$ close dot

Graph

$f(x) = 4 - x$

$y = 4 - x$

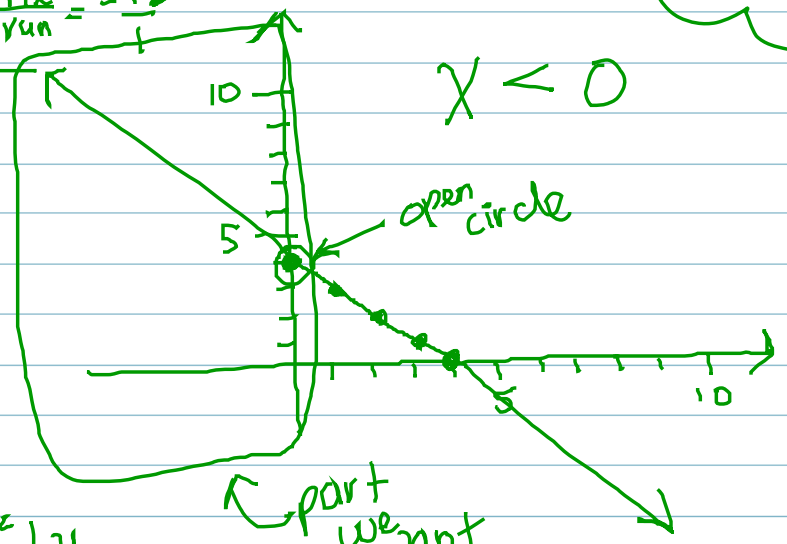
$y = -1x + 4 \rightarrow$ y-int $(0,4)$

$m = -1$

$\frac{\text{rise}}{\text{run}} = \frac{-1}{1}$

x	$4 - x = y$

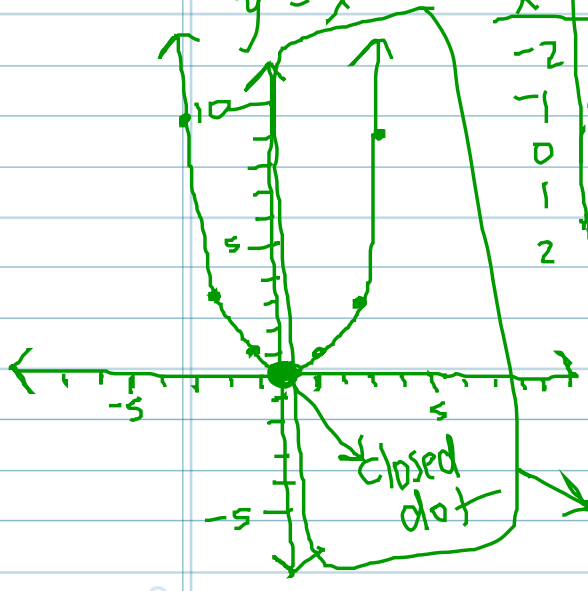
$x < 0$



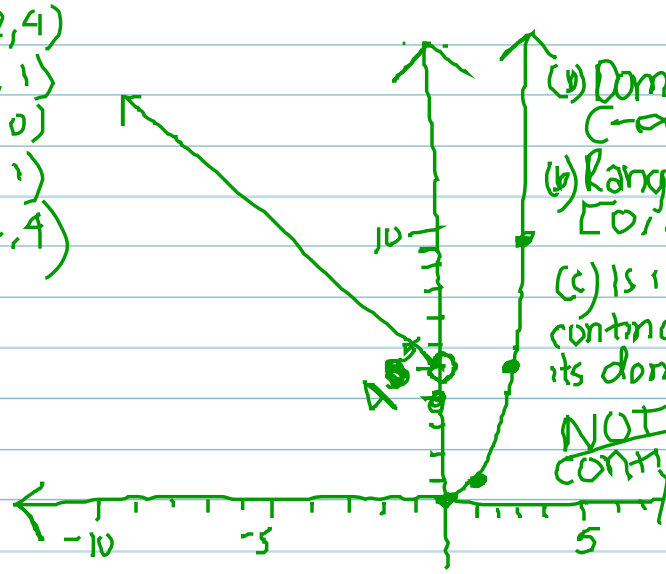
$x \geq 0$ $f(x) = x^2$

$y = x^2$

x	x^2	y	
-2	$(-2)^2 = 4$		$(-2,4)$
-1	$(-1)^2 = 1$		$(-1,1)$
0	$(0)^2 = 0$		$(0,0)$
1	$(1)^2 = 1$		$(1,1)$
2	$(2)^2 = 4$		$(2,4)$



what we want to keep



(a) Domain: $(-\infty, \infty)$

(b) Range: $[0, \infty)$

(c) Is it continous on its domain?

NOT continous

open dot

open dot

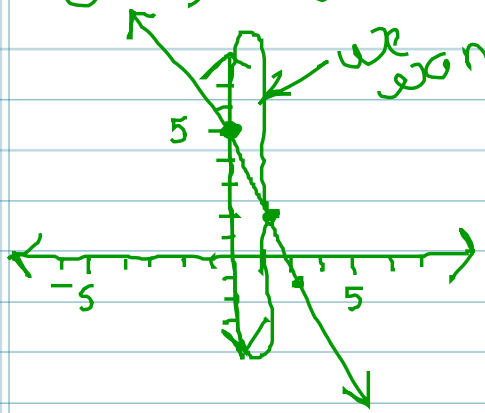
$$f(x) = \begin{cases} -3x+5 & 0 < x < 1 \\ 2 & x = 1 \\ 3x-1 & x \geq 1 \end{cases}$$

open dot

$y = -3x + 5$ ← $(0, 5)$

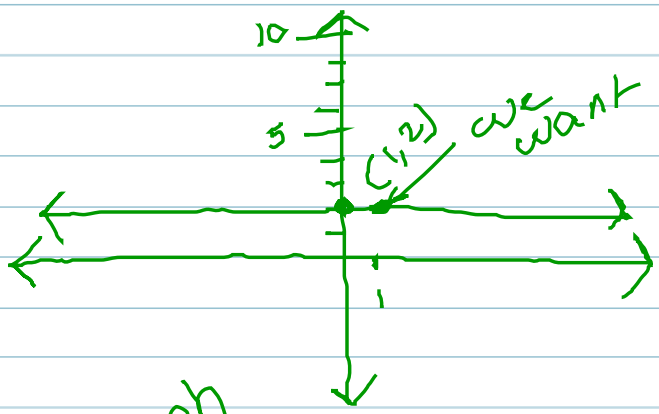
m

$f(x) = -3x + 5$



$f(x) = 2$

$y = 2$

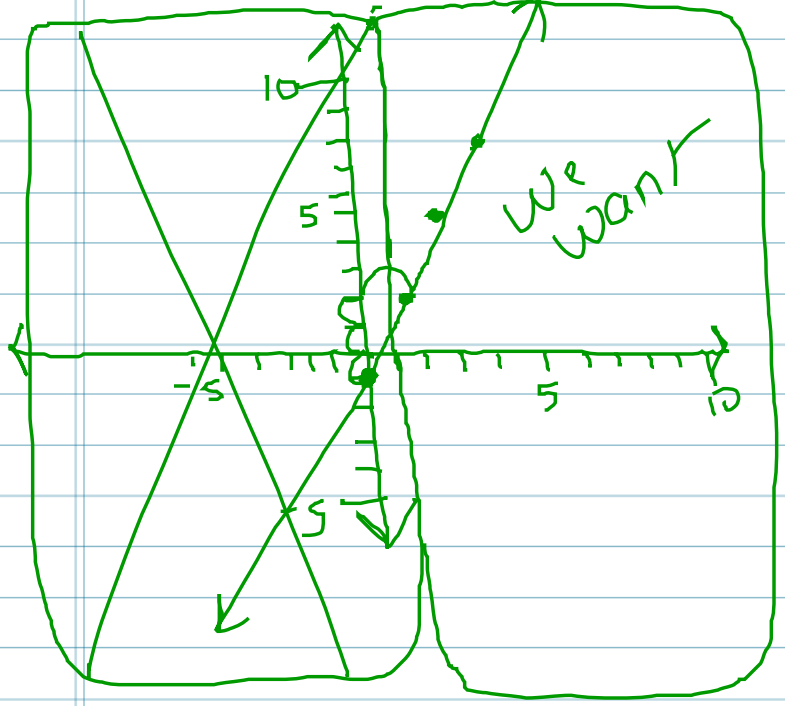


$f(x) = 3x - 1$

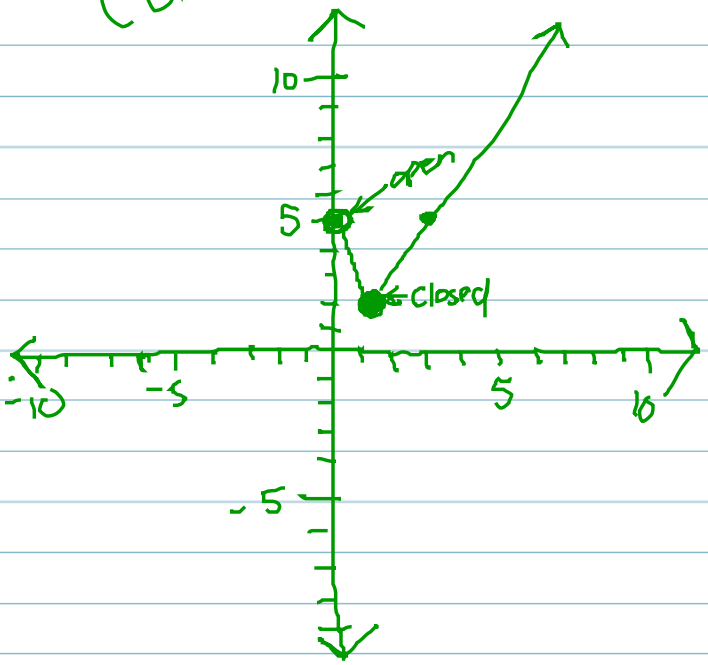
$y = 3x - 1$

$m = 3$

$(0, -1)$



Graph Continous



(26) left side

point (0,0)

slope: -1

x-coor 0

slope int form $y=mx+b$

point slope form $y-y_1=m(x-x_1)$

$y=-1x+0$ $m=-1$ $b=0$

$\boxed{y=-x}$

$f(x)=-x$

$$f(x)=\begin{cases} -x & \text{if } x\le 0 \\ -x+5 & \text{if } 5\ge x>0 \end{cases}$$

or

$0<x\le 5$

Right side

point (0, 5)

slope: -1

$y=mx+b$ $\quad$ $y-y_1=m(x-x_1)$

$y=-1x+5$