9/11/2012 - Sec 3.6 Math 1010

3.5

#45

$y = \sqrt{x-3}$ ← is a function

Ex: $y^4 = x$ defn: $\sqrt{0} = b$ $\sqrt{0} = 0$

$b^2 = 0$ $\sqrt{-4} = b$

$b = 0$ $b^2 = -4$ ← Never works

$\{$ $x-3$ to be always + $(+2)(+2) = +4$

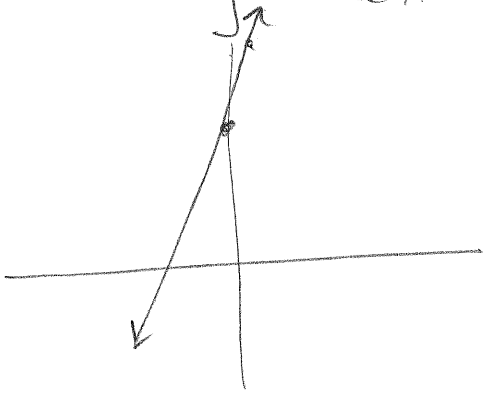
or to be zero $(-2)(-2) = +4$

$x - 3 \geq 0$

$+3 \quad +3$

$\boxed{x \geq 3}$ $[3, \infty)$

#36 $y = 6x + 8$



yes a function

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

#54 $y = \frac{7}{x-2}$ yes: is a function

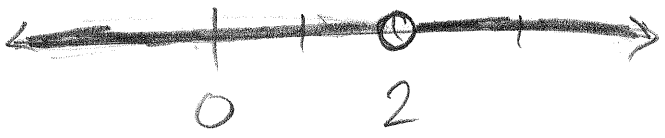
Domain: $x \neq 2$

or

$(-\infty, 2) \cup (2, \infty)$

$\cap$ ← and, has to be in both sets

$\cup$ ← or, anything in either set



Sec 3.6 Function Notation and Linear Functions

"y is a function of x"

so for each x there is exactly one y

$y = f(x)$ Input value

$f(x)$

Name of the function Relation

Not multiplication Notation!

input

$y = 6x + 8$

$f(x) = 6x + 8$

$f(2) = 6(2) + 8$

input is now 2

$= 12 + 8$

$f(x) = y$

$f(2) = 20$

$(2, 20)$

Let $g(x) = 2x^2 - 4x + 1$

"Read as g of x"

$g(3) = 2(3)^2 - 4(3) + 1$

$= 2 \cdot 9 - 12 + 1$

$g(3) = 7$

$g(t) = 2t^2 - 4t + 1$

$h(x) = 2x + 3$ ←

$h(t+1) = 2(t+1) + 3$ ← simplified

$= 2t + 2 + 3$

$h(t+1) = \boxed{2t + 5}$ ←

$x = 2$

$t = 2$

$t+1 = 3$

$h(x)$

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

$6 + 3$

$= 9$

$t = 2$

$h(2+1) =$

$2(2) + 5$

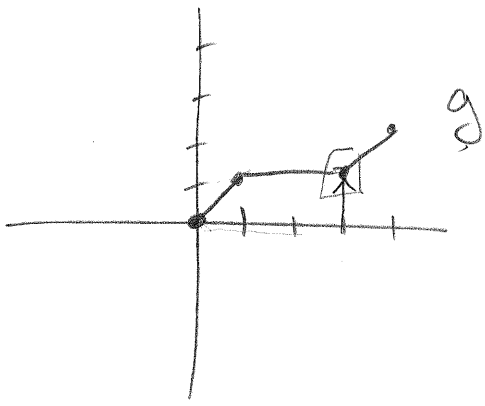
$4 + 5$

$= 9$

Ex: $f = \{(1, 2), (2, 5), (-5, 6)\}$

$f(2) = 5$

Ex:



$g(3) = 1$

If f is defined by an equation with x and y we can rewrite in function Notation

1st Solve for y

2nd Replace y with $f(x)$

Ex: $x - 4y = 12$

↑ solve for y

$-x \qquad -x$

$\frac{-4y}{-4} = \frac{-x}{-4} + \frac{12}{-4}$

$y = \frac{1}{4}x - 3$

$f(x) = \frac{1}{4}x - 3$

$f(8) = \frac{1}{4}(8) - 3$

$= 2 - 3$

$= -1$

A Linear Function is a function

that can be defined by

$$f(x) = ax + b$$

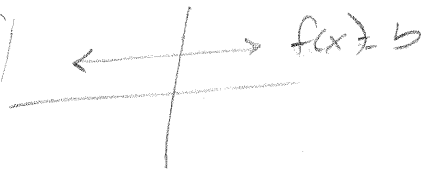
The value of a is the slope m

and the domain is $(-\infty, \infty)$

if $a = 0$

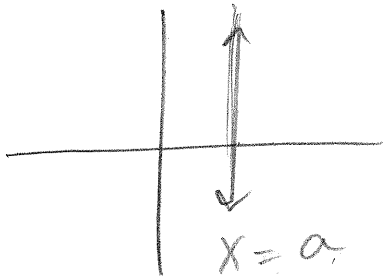
then a constant Function

which is the horizontal line

defined by $f(x) = b$ 

What about Vertical Lines?

$x = a$

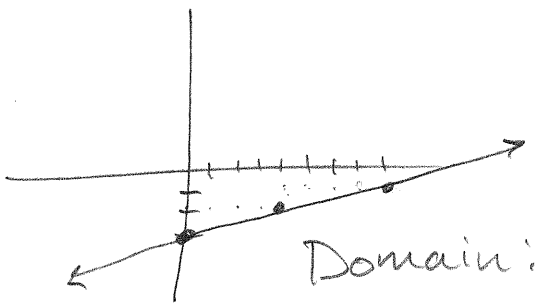


← Not a function

Graph the Linear Function, State Domain & Range

$$f(x) = \frac{1}{4}x - 3$$

↑ Slope ↑ y-int



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

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