Math 1496 – Calc 1

Review

Function – A function f is a rule that assigns to each value x (in a set D) a unique value denoted by $f(x)$ (in a set R)

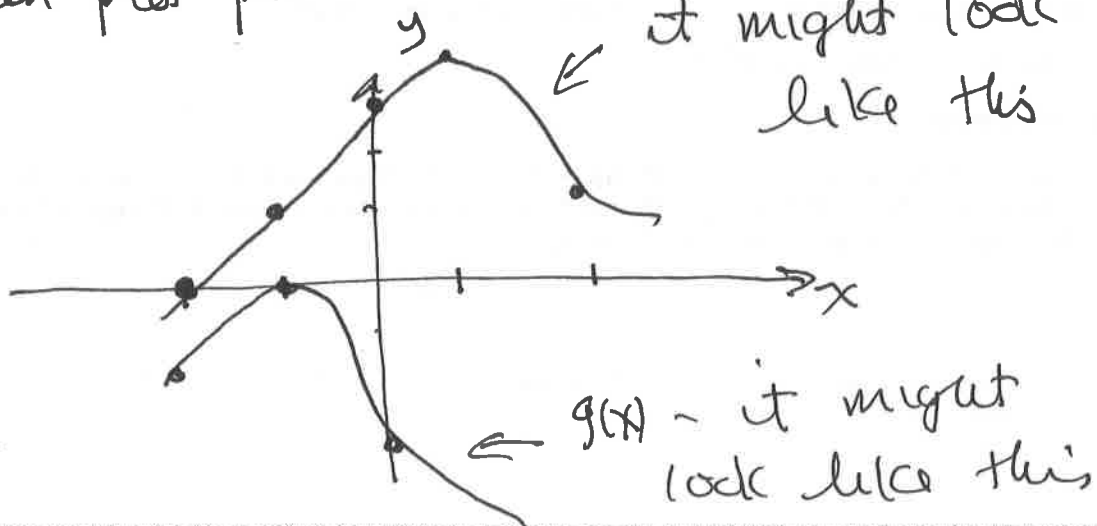
D – domain R – range

Ex 1 Briggs book pg 5 Table 8

x	-2	-1	0	1	2
$f(x)$	0	1	3	4	2
$g(x)$	-1	0	-2	-3	-4

we can plot order pair $(x, f(x))$

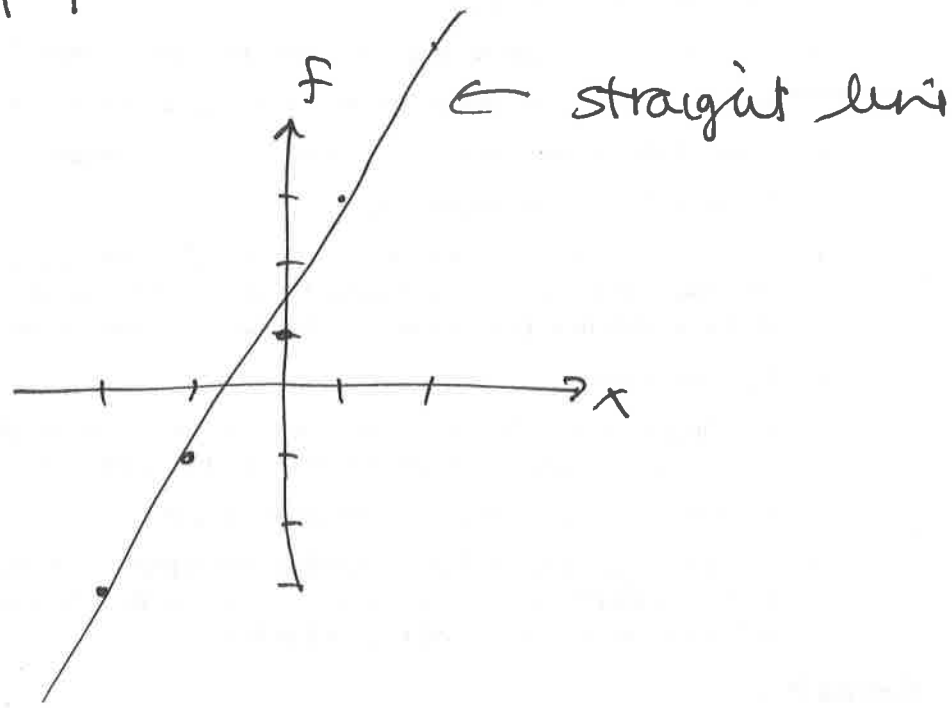
So we can plot pts



the function f(x) might be given

Ex 2 $f(x) = 2x + 1$

x	f(x)
-2	-3
-1	-1
0	1
1	3
2	5

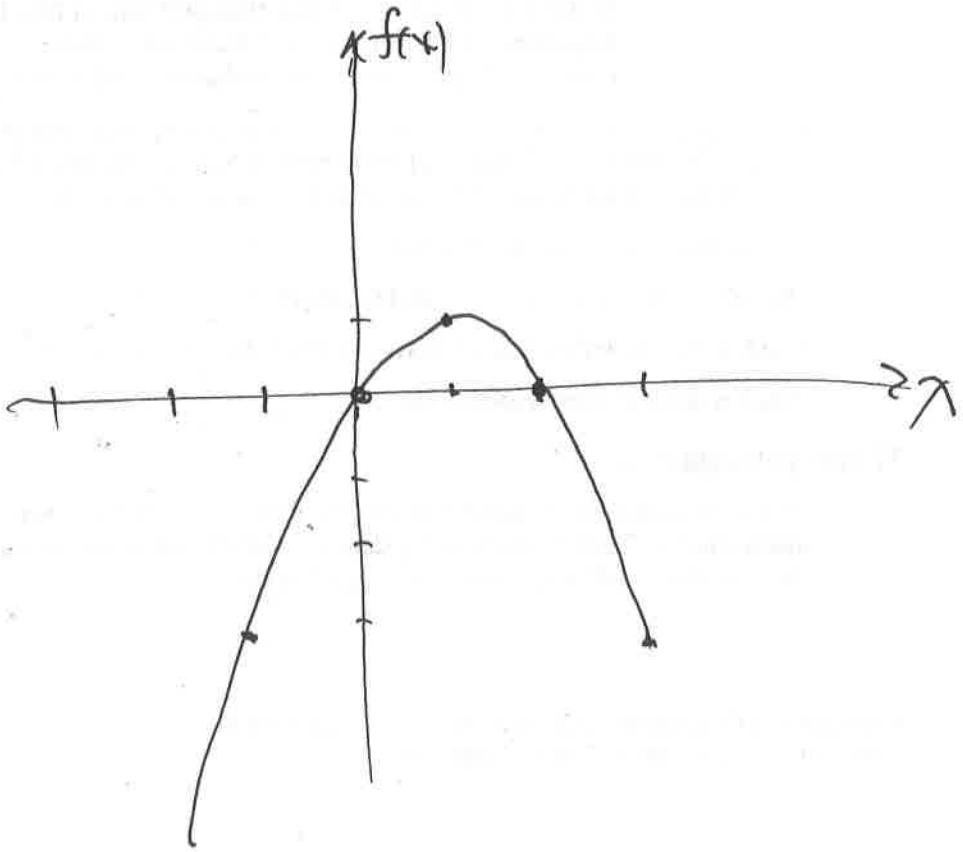


← straight line

Ex 3

a $f(x) = 3x - x^2$

x	f(x)
-3	-15
-2	-8
-1	-3
0	0
1	1
2	0
3	-3



Once we know the form of $f(x)$
we can calculate a lot of quantities

ex $f(1)$ $f(-2)$ $f(a)$ $f(x+h)$

if $f(x) = 2x - x^2$

$f(1) = 2(1) - 1 = 1$
$f(-2) = 2(-2) - (-2)^2 = -8$ } these are in the table

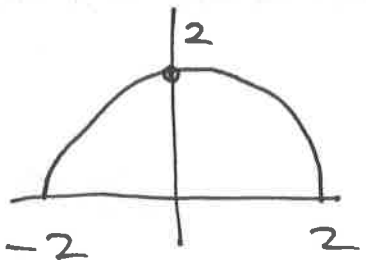
$f(a) = 2a - a^2$

$f(x+h) = 2(x+h) - (x+h)^2$

Domain & Range

for ex 2 ex 3 D is the entire real line
R is all real

ex $y = \sqrt{4 - x^2}$



in this ex

$D = \{x \mid -2 \le x \le 2\}$

$R = \{y \mid 0 \le y \le 2\}$

Composite Functions

We can add $f+g$, sub $f-g$
multiply fg or divide $\frac{f}{g}$
creating new fcts – called composite fcts

We can also compose in such a way that

$$f(g(x)) = fog(x)$$

Ex 5 $f(x) = 2x+1$ $g(x) = x^2$

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

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

Also

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

$g(f(x)) = (f(x))^2$

Table

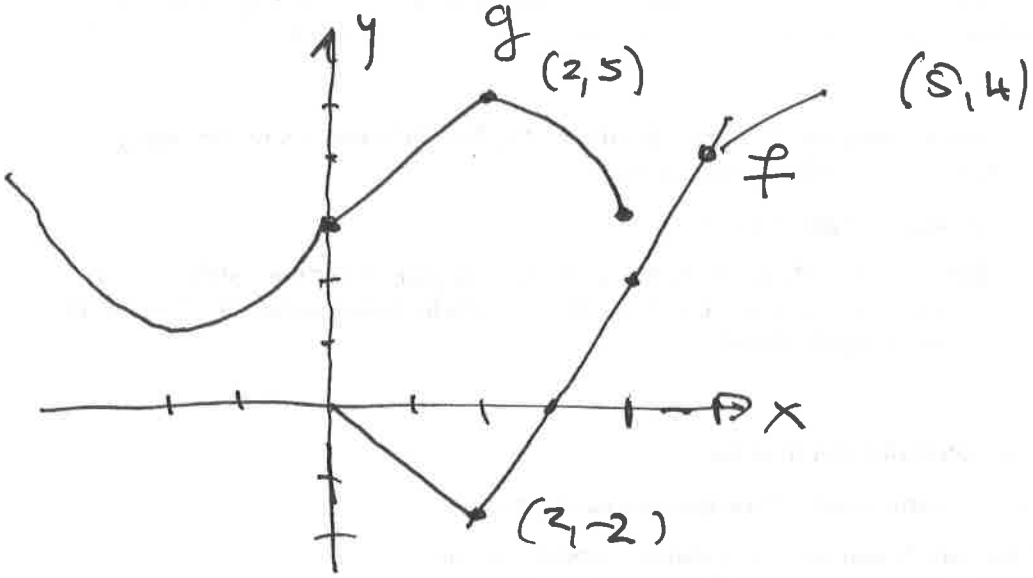
x	-2	-1	0	1	2
$f(x)$	0	1	3	4	2
$g(x)$	-1	0	-2	-3	-4

$f(g(0))$? $g(0) = -2$ $f(g(0)) = f(-2) = 0$

$g(f(-1))$?

$f(-1) = 1$ $\quad g(1) = -3$ so $\quad g(f(-1)) = -3$

What about using graphs



find $f(g(2))$

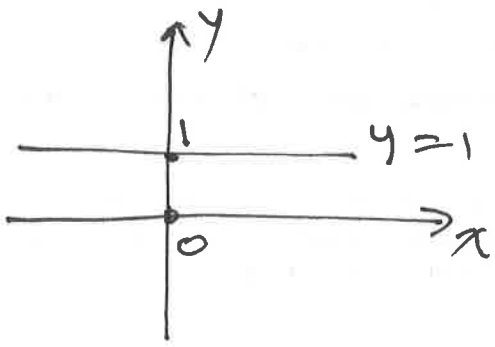
Now $\quad g(2) = 5$

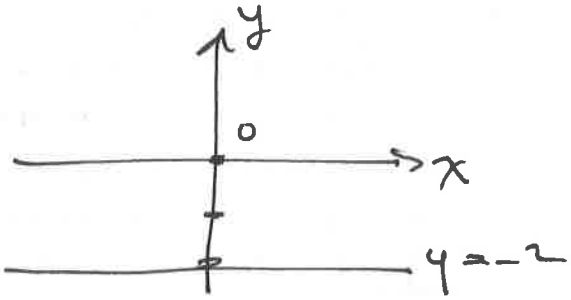
So now $\quad f(5) = 4$

so $\quad f(g(2)) = 4$

Simple Functions

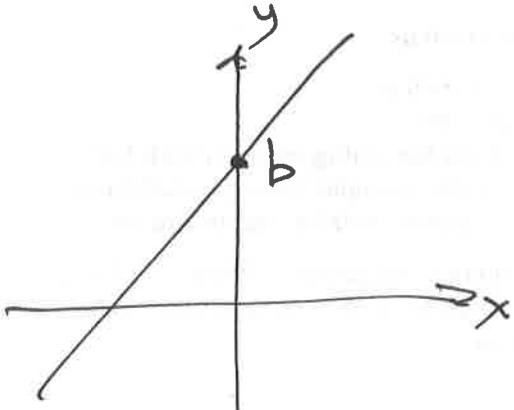
$y = 1$ & $y = -2$ — horizontal lines



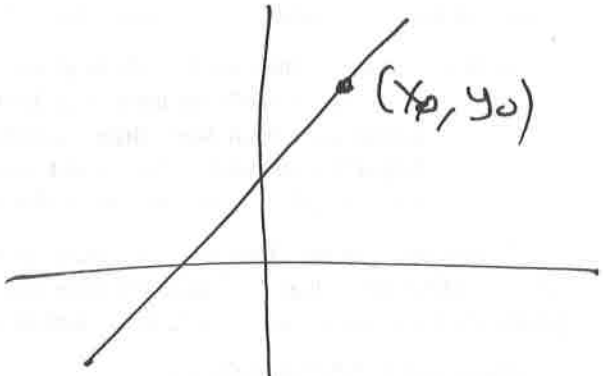


Next - straight lines

$y = mx + b$ & $y - y_0 = m(x - x_0)$



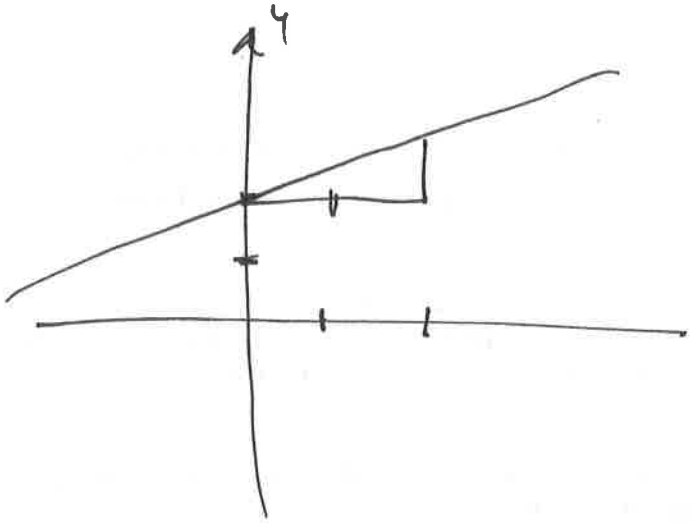
slope - intercept



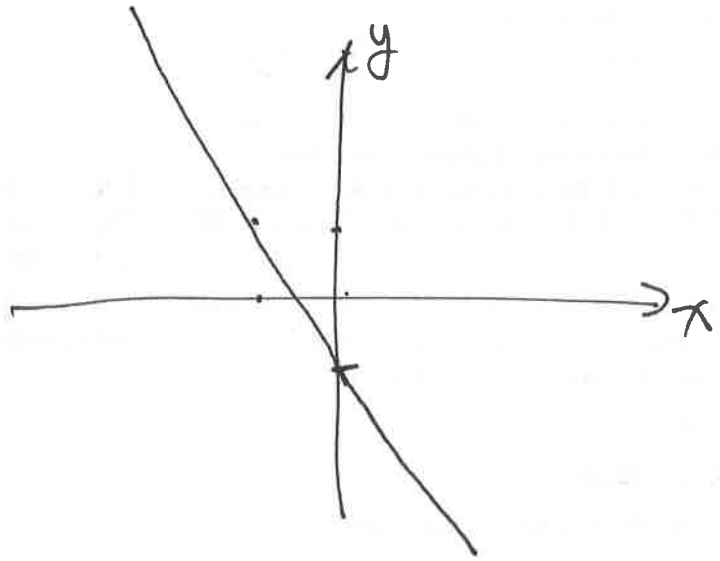
pt - slope

m - slope - $\frac{\text{rise}}{\text{run}}$

Ex $y = \frac{1}{2}x + 2$ slope $= \frac{1}{2}$



Ex $y = -2x - 1$ slope $= -2$



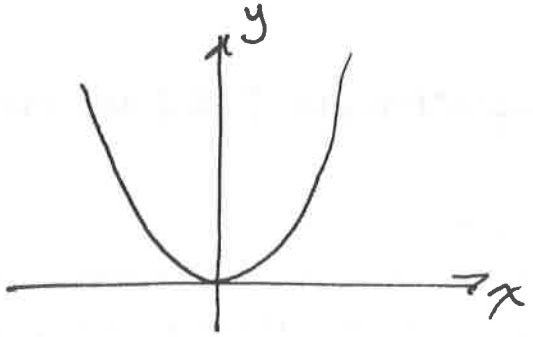
so they are pretty easy to dr

Find eq^n of line with the pt $(-1, 1)$ & $(2, 0)$

$m = \frac{\Delta y}{\Delta x} = \frac{0-1}{2-(-1)} = -\frac{1}{3}$ $\quad y - 1 = -\frac{1}{3}(x+1)$

Parabola

$y = x^2$



In general

$y = ax^2 + bx + c$ ⟩ need to complete the square

$= a(x+h)^2 + k$

Ex $y = 2x^2 - 8x + 9$

$= 2(x^2 - 4x) + 9$

$= 2(x^2 - 4x + 4 - 4) + 9$

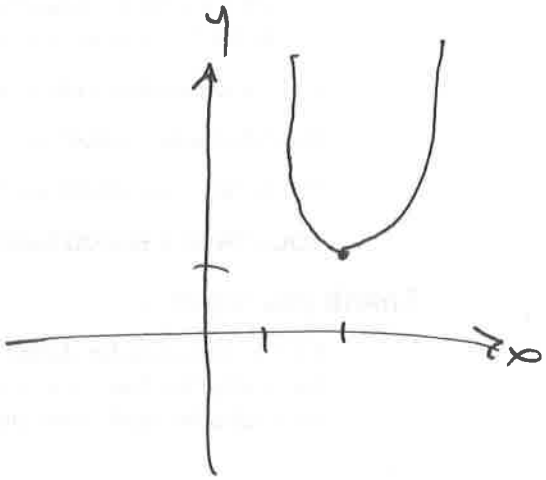
$= 2(x^2 - 4x + 4) - 8 + 9$

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

vertex - $(2, 1)$

$a > 0$

opens up



HW pg 10

13, 16, 25-36, 41, 42, 56a-c, 57, 59, 61, 63, 65 67, 69