8-24-class-notes

(1.1, #38) Find the domain and range and sketch graph of following: $\sqrt{4-x^2}$

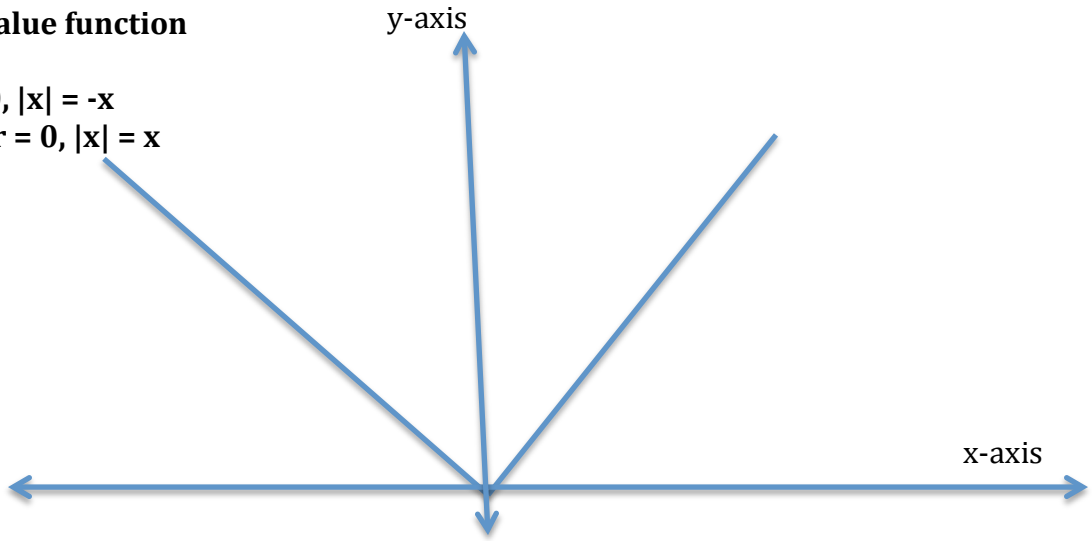
Continuing section 1.1:

Piecewise defined function

Defined in different ways in different parts of x – axis

Absolute value function

When x < 0, |x| = -x
For x > 0 or = 0, |x| = x



Floor function

Floor(x) = greatest integer smaller than x.

How would you write the formula for Floor(x) ?

Hint: You will need to divide x-axis into an infinite number of intervals, just as we divided it into two intervals for the absolute value function.

Answers at bottom of this document

Increasing and decreasing functions

A function f(x) is increasing if $f(x_1) < f(x_2)$ *whenever* $x_1 < x_2$; similarly for decreasing.

Is $f(x) = x^2$ an increasing function?
When is a linear function f(x) increasing? When is it decreasing?
Answers at bottom of this document

Even and odd functions (symmetry)

Even: reflecting about y-axis leaves graph unchanged. Algebraically, f(x) = f(-x)
Odd: reflecting about (0,0) leaves graph unchanged. Algebraically, f(x) = -f(-x)
Why can't a function be symmetric about x-axis?

Check for symmetry: $y = x^3 + x$; $y = \cos(x)$

Ans: x^3+x is odd function because when you plug in –x you get:
$(-x)^3+(-x) = -x^3-x = -(x^3+x) = -f(x)$
cos(x) is an even function because cos(-x) = cos(x).

Section 1.2: We will not be spending much time on this. Please read this by yourself. It is quite easy to read.

From the chart of average daily temperatures, you will see that on the left side the numbers are for Celsius and on the right side the numbers are for Fahrenheit.

Using only two pairs of numbers, find the function C(f) that changes Fahrenheit temperature to Celsius and F(c) that changes Celsius to Fahrenheit.

What kind of function is it and what would its graph look like?

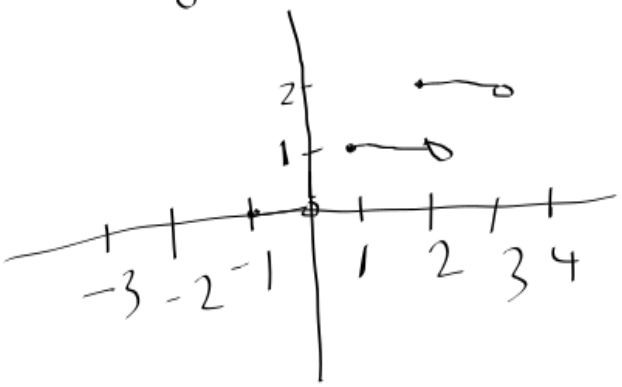
We will discuss this tomorrow (fri, 8/25/17)

Notes continues below……..

Graph of Floor function (only a partial graph!)

$\lfloor x \rfloor = \begin{cases} n & \text{if } n \le x < n+1 \\ \text{where } n \text{ is any integer} \end{cases}$

Graph of this function



$y = x^2$

N st always increasing

Increasing for $x \ge 0$
Decreasing for $x < 0$

Linear function: $y = mx +$
↑ when $m > 0$ & in reverse

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