Sept. 18

- MLC (Math Learning Centre) is open.
  - link on webpage.
  - LSK 301, 302
    - M-Th 11 - 6pm
    - F 11 - 2pm.
- Office Hours: Fri 1-3 in LSK 300C.
- Quiz #1 is Friday Sept. 25 in class (start of class).

Info (Quiz)
- Lab 1 - factoring
  - domain
- Lectures this week
  - trig / unit circle.

Example: Find x in $\mathbb{R}$ satisfying

$$\cos x \sin x + 1 = 1.$$

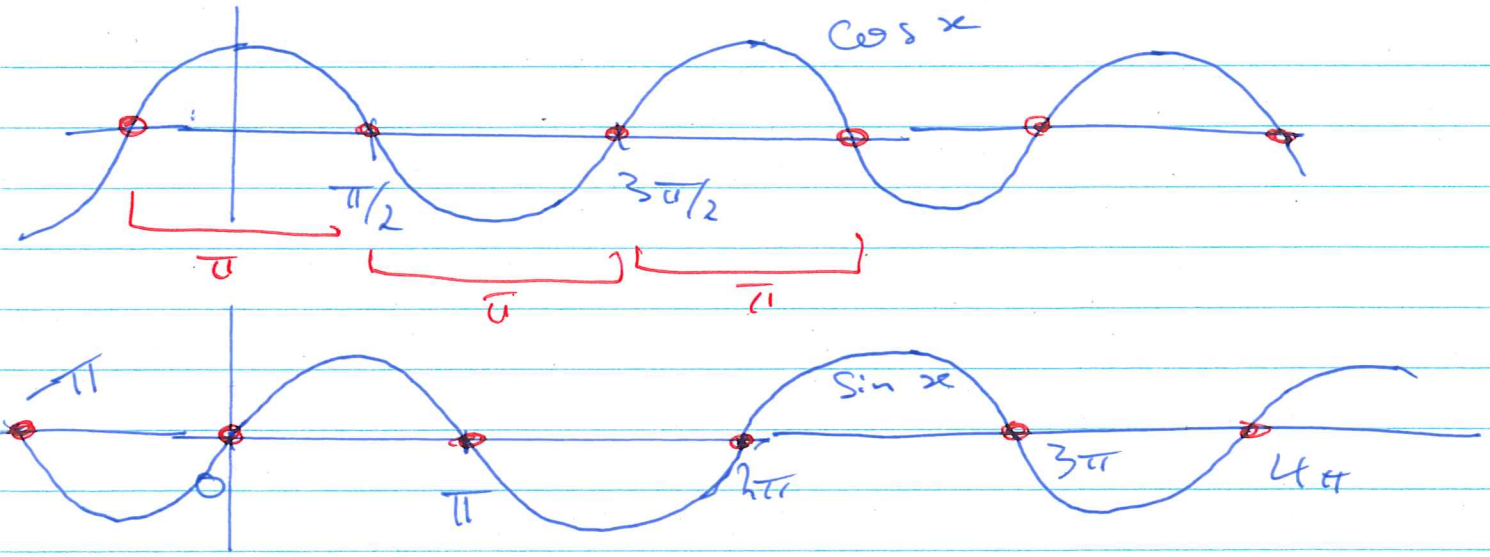
(start with $[0, 2\pi)$)

$$(\cos x)(\sin x) = 0.$$

Each time one is zero, the product is zero. Solve:

$$\cos x = 0 \qquad \sin x = 0.$$

Sept. 18



So, $x = \pi/2, 3\pi/2, \pi, 0$.

Find all solutions in $\mathbb{R}$.

Write all the solutions to $\sin x = 0$.

$x = n\pi$, $(n \in \mathbb{Z})$

- where n is an integer
- $n = \ldots, -2, -1, 0, 1, 2, \ldots$

Now for $\cos x = 0$.

$x = \pi/2 + n\pi$, n is an integer.

$\Rightarrow$ So finally $x = n\pi$, $\pi/2 + n\pi$.

n is an integer.

Sept. 18.

Example: Find x in $[0, 2\pi)$ satisfying

$$2\sin^2 x + \sin x = 1.$$

Factor it: Let $u = \sin x$

$$2u^2 + u - 1 = 0.$$
$$(2u-1)(u+1) = 0.$$

$$u = -1, \ 1/2.$$

$$\begin{cases} 2u^2 + 2u - u - 1 \\ 2u(u+1) - (u+1) \\ (2u-1)(u+1) \end{cases}$$

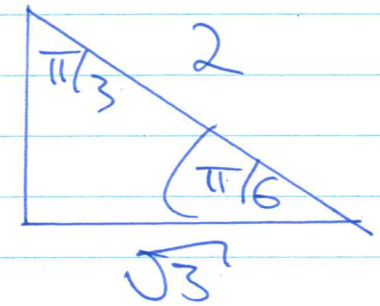
$$\sin x = -1, \ 1/2.$$

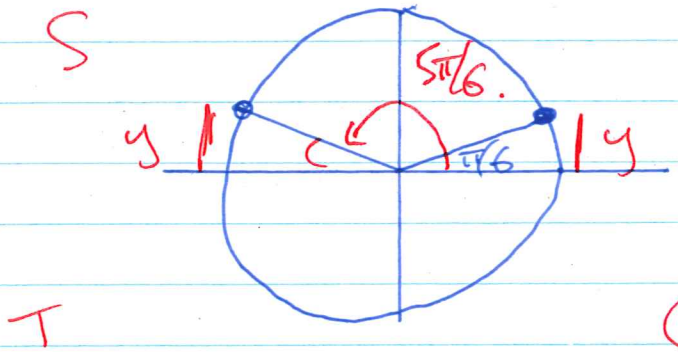
$$x = 3\pi/2, \ \pi/6, \ 5\pi/6$$

SOHCAHTOA

$\sin x = 1/2$ when

$x = \pi/6, \ 5\pi/6.$





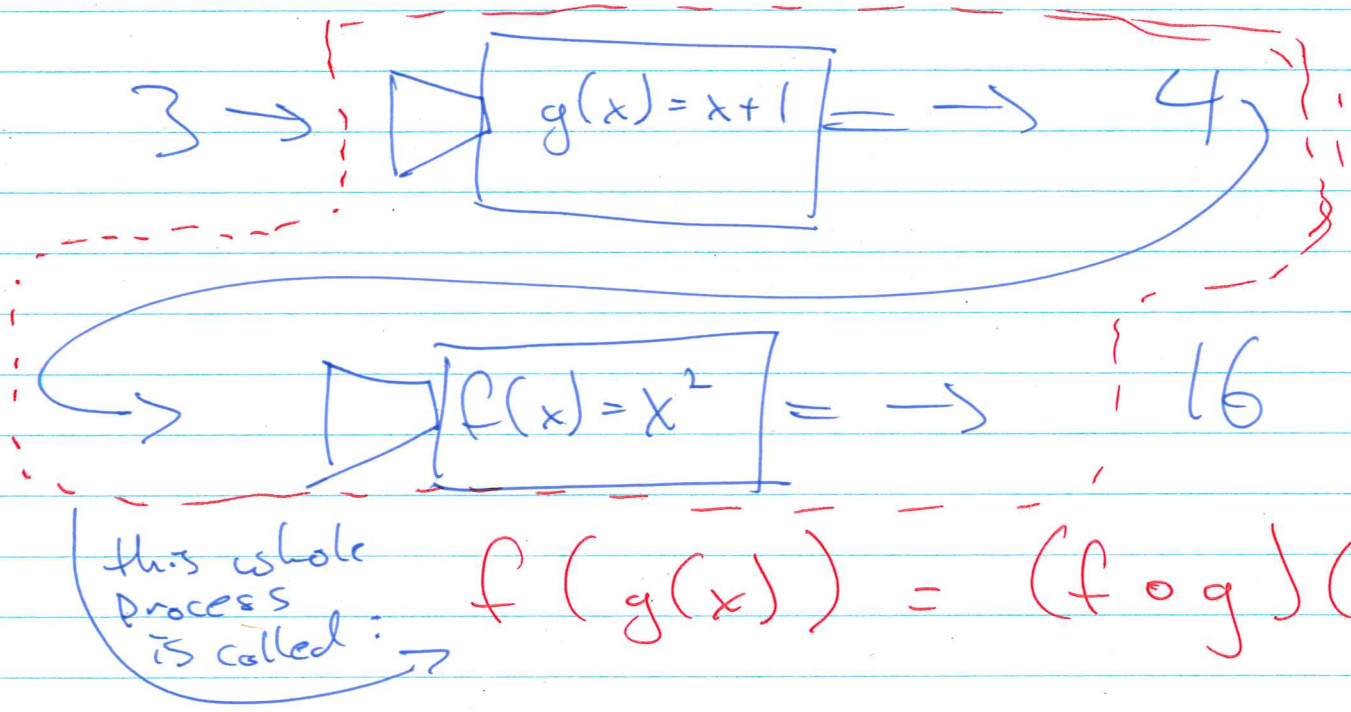
Sept. 18

Composition of Functions.

(and touch up on piecewise functions).

Given two functions $f(x)$ and $g(x)$ we can imagine taking the output from one function and using it as the input for the second function.

For example $g(x) = x + 1$
$f(x) = x^2$.



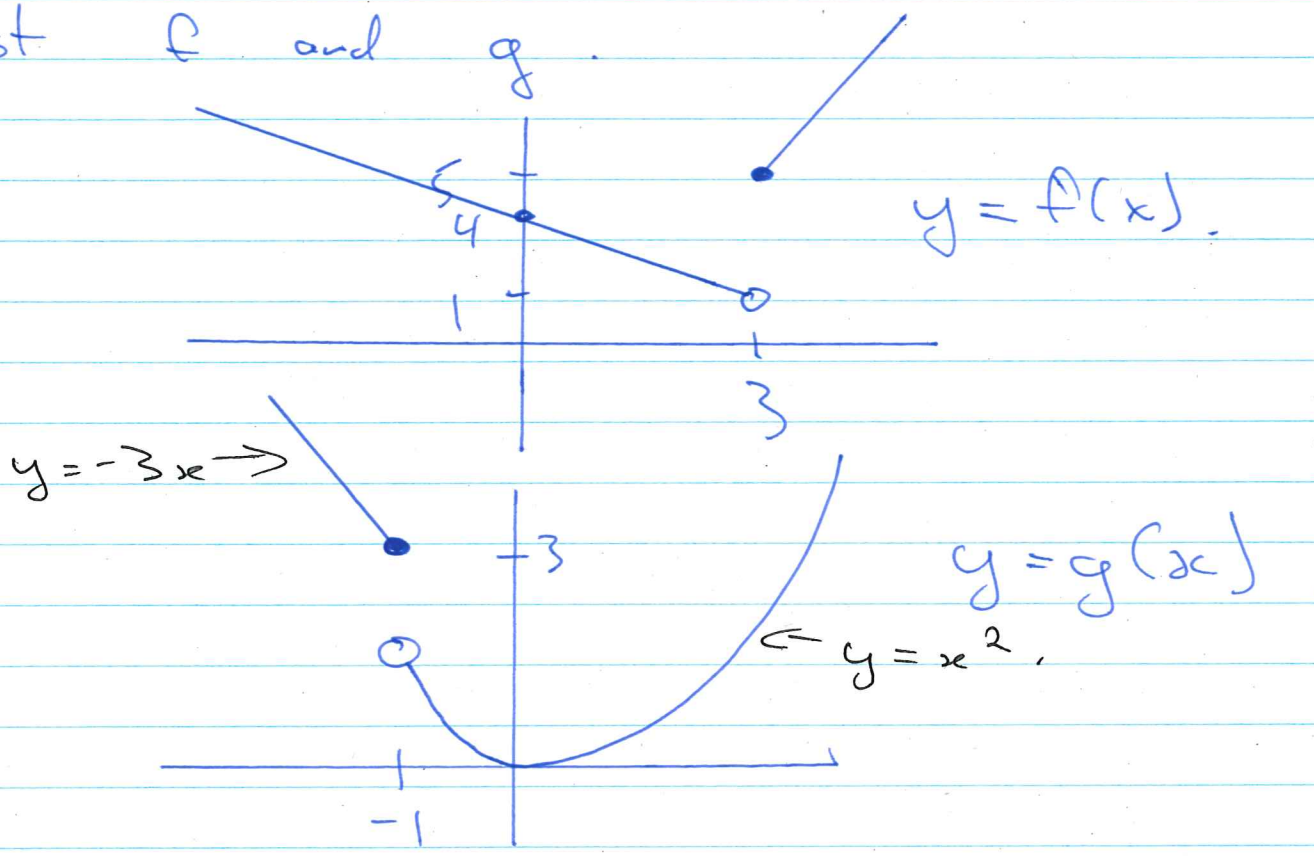
In this example $f(g(x)) = f(x+1)$
$= (x+1)^2$.

(5) Sept. 18

Let $f(x) = \begin{cases} 2x - 1, & x \geq 3 \\ -x + 4, & x < 3 \end{cases}$

$g(x) = \begin{cases} x^2, & x > -1 \\ -3x, & x \leq -1 \end{cases}$

Plot f and g.



Sept. 18.

Using previous f and g.

Clicker ②: What is $f(g(2))$?

A) 6 B) 3

C) 5 → D) 7

$f(g(2)) = f(4)$

$= 7.$

②: $f(g(2))$?

$g(2)$? $g(2) = 4.$

So, $f(g(2)) = f(4) = 7.$