NUMBER THEORY: CLASS 11

1. Exercise

1) Find all the solutions of the following system of congruences.

$x \equiv 1 \bmod 2$
$x \equiv 2 \bmod 3$
$x \equiv 3 \bmod 5$.

2) Use the Pollard rho method with $f(x) = x^2 - 1$ and $x_0 = 4$ to factor number 91.

3) We will learn how to write the code in Maple program.

Type the following code in Notepad. Once you're done, read the program from maple worksheet using command

$read\ \ `d:/.../.../Test.txt`;$

Then type

$Hi();$

First Program: Hi

Input: NULL
Output: message

$Hi := proc();$
$print("Hi,\ \ I\ \ love\ \ Number\ \ Theory");$
$end:$

Second Program: AddNumber

Date: Tuesday, September 30, 2008.

Input: integer n
Output: summation from 1 to n.

$AddNumber := proc(n)\ \ local\ \ S, i;$

$S := 0;$

$for\ \ i\ \ from\ \ 1\ \ to\ \ n\ \ do$
$S := S + i;$
$od:$

$return(S);$

$end:$

Third Program: SlowFactor

Input: integer n
Output: Factoring number n into two smaller numbers.

$SlowFactor := proc(n)\ \ local\ \ i;$

$for\ \ i\ \ from\ \ 2\ \ to\ \ floor(sqrt(n))\ \ do$
$if\ \ type(n/i, integer)\ \ then$
$return([i,\ \ n/i]);$
$fi:$
$od:$

$return(n, "IsPrime");$

$end:$

Problem: Modify SlowFactor by testing only primes less than $\sqrt{n}$.