# Homework: Math for Developers

This document defines homework assignments from the [“C# Basics“ Course @ Software University](http://softuni.bg/courses/csharp-basics/). Please submit as homework a single txt/doc/docx file holding the answers of all below described problems.

## Some Primes

Find the 24th, 101st and 251st prime number.

**24th – 89 , 101st – 547 , 251st – 1597**

## Some Fibonacci Primes

Check if the 24th, 101st and 251st prime numbers are part of the base Fibonacci number set. What is their position?

**24th prime number is 89 it’s part of Fibonacci (11th position)  
101st prime number is 547 it’s not part of Fibonacci**

**251st prime number is 1597 it’s part of Fibonacci (17th position)**

## Some Factorials

Find 100!, 171! and 250! Give all digits.  
  
**100! = 9.332621544 E+157 = 93326215443944152681699238856266700490715968264381621468592963895217599993229915608941463976156518286253697920827223758251185210916864000000000000000000000000**

**171! = 1.24101807 E+309 =1241018070217667823424840524103103992616605577501693185388951803611996075221691752992751978120487585576464959501670387052809889858690710767331242032218484364310473577889968548278290754541561964852153468318044293239598173696899657235903947616152278558180061176365108428800000000000000000000000000000000000000000  
250! = 3.23285626 E+492 = 3232856260909107732320814552024368470994843717673780666747942427112823747555111209488817915371028199450928507353189432926730931712808990822791030279071281921676527240189264733218041186261006832925365133678939089569935713530175040513178760077247933065402339006164825552248819436572586057399222641254832982204849137721776650641276858807153128978777672951913990844377478702589172973255150283241787320658188482062478582659808848825548800000000000000000000000000000000000000000000000000000000000000**

## Calculate Hypotenuse

You are given three right angled triangles. Find the length of their hypotenuses.

1. Catheti: 3 and 4 **C = sqrt(3^2 + 4^2) =sqrt(9+14) =sqrt(25) =5**
2. Catheti: 10 and 12 **C= sqrt(10^2 + 12^2) =sqrt(100+144)=sqrt(244)=15.6204993518**
3. Catheti 100 and 250 **C=sqrt(100^2+250^2) =sqrt(10 000+62 500)=sqrt(72 500) =269, 2582403567252**

## Numeral System Conversions

Convert 1234d to binary and hexadecimal numeral systems.  
**1234:2 = 617 | 0**

**617:2 = 308.5 | 1**

**308:2 = 154 | 0**

**154:2 = 77 | 0**

**77:2 = 38.5 | 1**

**38:2 = 19 | 0**

**19:2 = 9.5 | 1**

**9:2 = 4.5 | 1**

**4:2 = 2 | 0**

**2:2 = 1 | 0**

**1 | 1** **d> (10011010010)binary  
-------------------------------------------------  
1234:16 = 77.125 | 2**

**77:16 = 4.820313 | D**

**4 | 4 1234d = 4D2hexdecimal  
-------------------------------------------------**

Convert 1100101b to decimal and hexadecimal numeral systems.  
**1\*2^6+1\*2^5+0\*2^4+0\*2^3+1\*2^2+0\*2^1+1\*2^0= 64+32+0+0+4+0+1=101decimal  
1100101b = 65hex**

Convert ABChex to decimal and binary numeral systems.

**10\*16^2+11\*16^1+12x16^0=2560+176+12** **= 2748d**

**ABChex = 101010111100b**

**А = 10 = 1010**

**В = 11 = 1011**

**С = 12 = 1100**

## Least Common Multiple

Find LCM(1234, 3456).

**3456/2=1728**

**1728/2=864**

**864 / 2 = 432**

**432 / 2 = 216**

**216 / 2 = 108**

**108 / 2 = 54**

**54 / 2 = 27**

**27 / 3 = 9**

**9 / 3 = 3**

**3 / 3 = 1**

**3456 = 2\*2\*2\*2\*2\*2\*2\*3\*3\*3**

**1234 / 2 = 617**

**617 is prime number**

**1234 = 2\*617**

**LCM(1234, 3456) = (617\*2)\* (2\*2\*2\*2\*2\*2\*2\*3\*3\*3)**

**LCM(1234, 3456) = 617\*2\*2\*2\*2\*2\*2\*2\*3\*3\*3 = 2,132,352**

**A-65 – 0100 0001**

**T-84 – 0101 0100**

**A-65- 0100 0001**

**N-78- 0100 1110**

**A-65 – 0100 0001**

**S-83- 0101 0011**