**Homework: Math for Developers**

**Problem 1. Some Primes**

The 24th prime number is 89.

The 101th prime number is 547.

The 251th prime number is 1597.

Sieve of Eratosthenes finds prime numbers.

To solve this task I used <http://en.wikipedia.org/wiki/List_of_prime_numbers#The_first_500_prime_numbers>

**Problem 2. Some Fibonacci Primes**

The 24th prime number is part of the base Fibonacci number set. It position is 11.

The 101st prime number is not part of the base Fibonacci number set.

The 251st prime number is part of the base Fibonacci number set. It position is 17.

We can use the sequence Fn of Fibonacci numbers defined by the recurrence relation: http://www.maths.surrey.ac.uk/hosted-sites/R.Knott/Fibonacci/fibtable.html#series

F0 = 0, F1 = 1,

Fn = Fn-1 + Fn-2;

I used: <http://www.maths.surrey.ac.uk/hosted-sites/R.Knott/Fibonacci/fibtable.html#series>

**Problem 3. Some Factorials**

100! = 933262154439441526816992388562667004907159682643816214685

929638952175999932299156089414639761565182862536979208272

23758251185210916864000000000000000000000000;

171! = 124101807021766782342484052410310399261660557750169318538

895180361199607522169175299275197812048758557646495950167

0387052809889858690710767331242032218484364310473577889968

548278290754541561964852153468318044293239598173696899657235903947616152278558180061176365108428800000000000000000000000000000000000000000;

250! = 323285626090910773232081455202436847099484371767378066674

794242711282374755511120948881791537102819945092850735318

943292673093171280899082279103027907128192167652724018926

473321804118626100683292536513367893908956993571353017504

051317876007724793306540233900616482555224881943657258605

739922264125483298220484913772177665064127685880715312897

877767295191399084437747870258917297325515028324178732065

818848206247858265980884882554880000000000000000000000000

0000000000000000000000000000000000000;

I used:

<http://www.calculatorsoup.com/calculators/discretemathematics/factorials.php>

**Problem 4. Calculate Hypotenuse**

1. Catheti 3 and 4: The hypotenuse calculates using the Pythagorean theorem

c = = =5;

1. Catheti 10 and 12:

c = = 2 = 2;

1. Catheti 100 and 250:

c = = 50 = 50;

**Problem 5. Numeral System Conversion**

1234d / 2 | 0 = 10011010010b  1234d / 16 | 2 = 4D2hex

617 / 2 | 1 77 / 16 | 13

308 / 2 | 0 4 / 16 | 4

154 / 2 | 0 0

77 / 2 | 1

38 / 2 | 0

19 / 2 | 1

4 / 2 | 0

2 / 2 | 0

1 / 2 | 1

0

1100101b = 1. + 0.+ 1. + 0. + 0.+ 1. + 1. = 1 + 0 + 4 + 0 + 0 +

+ 32 + 64 = 101d

110 0101b = 65hex

0. + 1. + 0. + 1.= 5

0. + 1. + 1. + 0. = 6

ABChex = C. + B. + A.162 = 12.1 + 11.16 + 10.256 = 2748d

ABChex = 101010111100b

10 11 12

1.23 +1.22 + 0.21 + 0.20

1.23 + 0.22 + 1.21 + 1.20

1.23 + 0.22 +1.21 + 0.20

**Problem 6. Least Common Multiple**

LCM (1234, 3456) = ?;

LCM (a, b) = ;

GCD (1234, 3456) = 3456 : 1234 = 2 | 988

1234 : 988 = 1 | 246

988 : 246 = 4 | 4

246 : 4 = 61 | 2

4 : 2 = 2 | 0

GCD (1234, 3456) = 2;

LCM (1234, 3456) = = 2132352;