Homework: Math for Developers

This document defines homework assignments from the "C# Basics" Course @ Software University. Please submit as homework a single `txt/doc/docx` file holding the answers of all below described problems.

Problem 1. Some Primes

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

Answer:

24th prime number is 89.

101st prime number is 547.

251st prime number is 1597.

Problem 2. Some Fibonacci Primes

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

Answer:

24th prime is 89 and is number 11 in the Fibonacci sequence.

101th prime is 547 and is not a member of the Fibonacci sequence.

251st prime is 1597 and is 17th Fibonacci number.

Problem 3. Some Factorials

Find 100!, 171! and 250! Give all digits.

Answer:

100! =
93326215443944152681699238856266700490715968264381621468592963895217599993229915608941463976156518286253697920827223758251185210916864000000000000000000000000

171! =
12410180702176678234248405241031039926166055775016931853889518036119960752216917529927519781204875855764649595016703870528098898586907107673312420322184843643104735778899685482782907545415619648521534683180442932395981736968996572359039476161522785581800611763651084288000000000000000000000000000000000000000000000000000000000000000000000000

250! =
32328562609091077323208145520243684709948437176737806667479424271128237475551112094888179153710281994509285073531894329267309317128089908227910302790712819216765272401892647332180411862610068329253651336789390895699357135301750405131787600772479330654023390061648255522488194365725860573992226412548329822048491377217766506412768588071531289787776729519139908443774787025891729732551502832417873206581884820624785826598088488255488000000000000000000000000000000000000000000000000000000000000000000000000

Problem 4. Calculate Hypotenuse

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

1. *Catheti: 3 and 4*
2. *Catheti: 10 and 12*
3. *Catheti 100 and 250*

Answer:
Using the formula of Pythagoras.

1. Hypotenuses is 5
2. Hypotenuses is 2*sqrt(61) ≈ 15.62
3. Hypotenuses is 50*sqrt(29) ≈ 269.26

Problem 5. Numeral System Conversions

Convert 1234_d to binary and hexadecimal numeral systems.

Convert 1100101_b to decimal and hexadecimal numeral systems.

Convert ABC_{hex} to decimal and binary numeral systems.

Answer:

1234_d to binary is 10011010010_b and hexadecimal is $4D2_{hex}$.

1100101_b to decimal is 101_d and hexadecimal is $65_{hex.}$

$ABC_{hex.}$ To decimal is 2748_d and binary is 101010111100_b

Problem 6. Least Common Multiple

Find LCM(1234, 3456).

Answer:

2132352