Homework: Math for Developers

# Problem 1 . Some Primes

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

24th = 89

101st = 547

251st = 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?

Fibonacci sequence : 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987,1597.

Prime numbers 89 and 1597 are in Fibonacci sequence , 547 is not in Fibonacci numbers.

# Problem 3 . Some Factorials

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

100!=100\*99\*98\*97\*96\*95\*93\*92\*91\*90\*89\*88\*87\*86\*85\*84\*83\*82\*81\*80\*79\*78\*77\*76\*75\*74\*73\*72\*71\*70\*69\*68\*67\*66\*65\*64\*63\*62\*61\*60\*59\*58\*57\*56\*55\*54\*53\*52\*51\*50\*49\*48\*47\*46\*45\*44\*43\*42\*41\*40\*39\*38\*37\*36\*35\*34\*33\*32\*31\*30\*29\*28\*27\*26\*25\*24\*23\*22\*21\*20\*19\*18\*17\*16\*15\*14\*13\*12\*11\*10\*9\*8\*7\*6\*5\*4\*3\*2\*1=93326215443944152681699238856266700490715968264381621468592963895217599993229915608941463976156518286253697920827223758251185210916864000000000000000000000000

171!=171\*170\*169\*168\*167\*166\*165\*164\*163\*162\*161\*160\*159\*158\*157\*156\*155\*154\*153\*152\*151\*150\*149\*148\*147\*146\*145\*144\*143\*142\*141\*140\*139\*138\*137\*136\*135\*134\*133\*132\*131\*130\*129\*128\*127\*126\*125\*124\*123\*122\*121\*120\*119\*118\*117\*116\*115\*114\*113\*112\*111\*110\*109\*108\*107\*106\*105\*104\*103\*102\*101\*100\*99\*98\*97\*96\*95\*93\*92\*91\*90\*89\*88\*87\*86\*85\*84\*83\*82\*81\*80\*79\*78\*77\*76\*75\*74\*73\*72\*71\*70\*69\*68\*67\*66\*65\*64\*63\*62\*61\*60\*59\*58\*57\*56\*55\*54\*53\*52\*51\*50\*49\*48\*47\*46\*45\*44\*43\*42\*41\*40\*39\*38\*37\*36\*35\*34\*33\*32\*31\*30\*29\*28\*27\*26\*25\*24\*23\*22\*21\*20\*19\*18\*17\*16\*15\*14\*13\*12\*11\*10\*9\*8\*7\*6\*5\*4\*3\*2\*1=1241018070217667823424840524103103992616605577501693185388951803611996075221691752992751978120487585576464959501670387052809889858690710767331242032218484364310473577889968548278290754541561964852153468318044293239598173696899657235903947616152278558180061176365108428800000000000000000000000000000000000000000

250!=250\*249\*248\*247\*246\*245\*244\*243\*242\*241\*240\*239\*238\*237\*236\*235\*234\*233\*232\*231\*230\*229\*228\*227\*226\*225\*224\*223\*222\*221\*220\*219\*218\*217\*216\*215\*214\*213\*212\*211\*210\*209\*208\*207\*206\*205\*204\*203\*202\*201\*200\*199\*198\*197\*196\*195\*194\*193\*192\*191\*190\*189\*187\*186\*185\*184\*183\*182\*181\*180\*179\*178\*177\*176\*175\*174\*173\*172\*171\*170\*169\*168\*167\*166\*165\*164\*163\*162\*161\*160\*159\*158\*157\*156\*155\*154\*153\*152\*151\*150\*149\*148\*147\*146\*145\*144\*143\*142\*141\*140\*139\*138\*137\*136\*135\*134\*133\*132\*131\*130\*129\*128\*127\*126\*125\*124\*123\*122\*121\*120\*119\*118\*117\*116\*115\*114\*113\*112\*111\*110\*109\*108\*107\*106\*105\*104\*103\*102\*101\*100\*99\*98\*97\*96\*95\*93\*92\*91\*90\*89\*88\*87\*86\*85\*84\*83\*82\*81\*80\*79\*78\*77\*76\*75\*74\*73\*72\*71\*70\*69\*68\*67\*66\*65\*64\*63\*62\*61\*60\*59\*58\*57\*56\*55\*54\*53\*52\*51\*50\*49\*48\*47\*46\*45\*44\*43\*42\*41\*40\*39\*38\*37\*36\*35\*34\*33\*32\*31\*30\*29\*28\*27\*26\*25\*24\*23\*22\*21\*20\*19\*18\*17\*16\*15\*14\*13\*12\*11\*10\*9\*8\*7\*6\*5\*4\*3\*2\*1=3232856260909107732320814552024368470994843717673780666747942427112823747555111209488817915371028199450928507353189432926730931712808990822791030279071281921676527240189264733218041186261006832925365133678939089569935713530175040513178760077247933065402339006164825552248819436572586057399222641254832982204849137721776650641276858807153128978777672951913990844377478702589172973255150283241787320658188482062478582659808848825548800000000000000000000000000000000000000000000000000000000000000

# 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

|  |  |  |
| --- | --- | --- |
| 1.  a²+b²=c²  3²+4²=c²  9+16=c²  25=c²  c²=25  c=√25  c=5 | 2.  a²+b²=c²  10²+12²=c²  100+144=c²  244=c²  c²=244  c=√244  c=15.6 | 3.  a²+b²=c²  100²+250²=c²  10000+62500=c²  72500=c²  c²=72500  c=√72500  c=269.25 |

i will use The Pethagorean theorem a²+b²=c²

# Problem 5. Numeral System Conversions

Convert 1234d to binary and hexadecimal numeral systems.

Convert 1100101b to decimal and hexadecimal numeral systems.

Convert ABChex to decimal and binary numeral systems.

1234d = 10011010010b ; 1234d=4D2hex

1100101b = 101d ; 1100101 = 65hex

ABChex = 2748d ; ABChex = 101010111100

# Problem 6 .Least Common Multiple

Find LCM(1234, 3456).

|  |  |
| --- | --- |
| 1234 2  617 617  1 | 3456 2  1728 2  864 2  432 2  216 2  108 2  54 2  27 3  9 3  3 3  1 |

1234 = 2\*617

3456 = 27\*33

**LCM** = 27\*617\*33 = 2132352