

NUMERE PRIME

Numerele prime până la 100.000

<http://sorinborodi.ro>

2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97

101 103 107 109 113 127 131 137 139 149 151 151 157 163 167 173 179 181 191 193 197
199 211 223 227 229 233 239 241 251 257 263 269 271 277 281 283 293 307 311 313
317 331 337 347 349 353 359 367 373 379 383 389 397 401 409 419 421 431 433 439
443 449 457 461 463 467 479 487 491 499 503 509 521 523 541 547 557 563 569 571
577 587 593 599 601 607 613 617 619 631 641 643 647 653 659 661 673 677 683 691
701 709 719 727 733 739 743 751 757 761 769 773 787 797 809 811 821 823 827 829
839 853 857 859 863 877 881 883 887 907 911 919 929 937 941 947 953 967 971 977
983 991 997

1009 1013 1019 1021 1031 1033 1039 1049 1051 1061 1063 1069 1087 1091 1093 1097
1103 1109 1117 1123 1129 1151 1153 1163 1171 1181 1187 1193 1201 1213 1217 1223
1229 1231 1237 1249 1259 1277 1279 1283 1289 1291 1297 1301 1303 1307 1319 1321
1327 1361 1367 1373 1381 1399 1409 1423 1427 1429 1433 1439 1447 1451 1453 1459
1471 1481 1483 1487 1489 1493 1499 1511 1523 1531 1543 1549 1553 1559 1567 1571
1579 1583 1597 1601 1607 1609 1613 1619 1621 1627 1637 1657 1663 1667 1669 1693
1697 1699 1709 1721 1723 1733 1741 1747 1753 1759 1777 1783 1787 1789 1801 1811
1823 1831 1847 1861 1867 1871 1873 1877 1879 1889 1901 1907 1913 1931 1933 1949
1951 1973 1979 1987 1993 1997 1999 2003 2011 2017 2027 2029 2039 2053 2063 2069
2081 2083 2087 2089 2099 2111 2113 2129 2131 2137 2141 2143 2153 2161 2179 2203
2207 2213 2221 2237 2239 2243 2251 2267 2269 2273 2281 2287 2293 2297 2309 2311
2333 2339 2341 2347 2351 2357 2371 2377 2381 2383 2389 2393 2399 2411 2417 2423
2437 2441 2447 2459 2467 2473 2477 2503 2521 2531 2539 2543 2549 2551 2557 2579
2591 2593 2609 2617 2621 2633 2647 2657 2659 2663 2671 2677 2683 2687 2689 2693
2699 2707 2711 2713 2719 2729 2731 2741 2749 2753 2767 2777 2789 2791 2797 2801
2803 2819 2833 2837 2843 2851 2857 2861 2879 2887 2897 2903 2909 2917 2927 2939
2953 2957 2963 2969 2971 2999 3001 3011 3019 3023 3037 3041 3049 3061 3067 3079
3083 3089 3109 3119 3121 3137 3163 3167 3169 3181 3187 3191 3203 3209 3217 3221
3229 3251 3253 3257 3259 3271 3299 3301 3307 3313 3319 3323 3329 3331 3343 3347
3359 3361 3371 3373 3389 3391 3407 3413 3433 3449 3457 3461 3463 3467 3469 3491
3499 3511 3517 3527 3529 3533 3539 3541 3547 3557 3559 3571 3581 3583 3593 3607
3613 3617 3623 3631 3637 3643 3659 3671 3673 3677 3691 3697 3701 3709 3719 3727
3733 3739 3761 3767 3769 3779 3793 3797 3803 3821 3823 3833 3847 3851 3853 3863
3877 3881 3889 3907 3911 3917 3919 3923 3929 3931 3943 3947 3967 3989 4001 4003
4007 4013 4019 4021 4027 4049 4051 4057 4073 4079 4091 4093 4099 4111 4127 4129
4133 4139 4153 4157 4159 4177 4201 4211 4217 4219 4229 4231 4241 4243 4253 4259
4261 4271 4273 4283 4289 4297 4327 4337 4339 4349 4357 4363 4373 4391 4397 4409
4421 4423 4441 4447 4451 4457 4463 4481 4483 4493 4507 4513 4517 4519 4523 4547
4549 4561 4567 4583 4591 4597 4603 4621 4637 4639 4643 4649 4651 4657 4663 4673
4679 4691 4703 4721 4723 4729 4733 4751 4759 4783 4787 4789 4793 4799 4801 4813
4817 4831 4861 4871 4877 4889 4903 4909 4919 4931 4933 4937 4943 4951 4957 4967
4969 4973 4987 4993 4999 5003 5009 5011 5021 5023 5039 5051 5059 5077 5081 5087
5099 5101 5107 5113 5119 5147 5153 5167 5171 5179 5189 5197 5209 5227 5231 5233
5237 5261 5273 5279 5281 5297 5303 5309 5323 5333 5347 5351 5381 5387 5393 5399
5407 5413 5417 5419 5431 5437 5441 5443 5449 5471 5477 5479 5483 5501 5503 5507
5519 5521 5527 5531 5557 5563 5569 5573 5581 5591 5623 5639 5641 5647 5651 5653
5657 5659 5669 5683 5689 5693 5701 5711 5717 5737 5741 5743 5749 5779 5783 5791
5801 5807 5813 5821 5827 5839 5843 5849 5851 5857 5861 5867 5869 5879 5881 5897
5903 5923 5927 5939 5953 5981 5987 6007 6011 6029 6037 6043 6047 6053 6067 6073
6079 6089 6091 6101 6113 6121 6131 6133 6143 6151 6163 6173 6197 6199 6203 6211
6217 6221 6229 6247 6257 6263 6269 6271 6277 6287 6299 6301 6311 6317 6323 6329
6337 6343 6353 6359 6361 6367 6373 6379 6389 6397 6421 6427 6449 6451 6469 6473
6481 6491 6521 6529 6547 6551 6553 6563 6569 6571 6577 6581 6599 6607 6619 6637
6653 6659 6661 6673 6679 6689 6691 6701 6703 6709 6719 6733 6737 6761 6763 6779
6781 6791 6793 6803 6823 6827 6829 6833 6841 6857 6863 6869 6871 6883 6899 6907
6911 6917 6947 6949 6959 6961 6967 6971 6977 6983 6991 6997 7001 7013 7019 7027
7039 7043 7057 7069 7079 7103 7109 7121 7127 7129 7151 7159 7177 7187 7193 7207
7211 7213 7219 7229 7237 7243 7247 7253 7283 7297 7307 7309 7321 7331 7333 7349
7351 7369 7393 7411 7417 7433 7451 7457 7459 7477 7481 7487 7489 7499 7507 7517

7523 7529 7537 7541 7547 7549 7559 7561 7573 7577 7583 7589 7591 7603 7607 7621
7639 7643 7649 7669 7673 7681 7687 7691 7699 7703 7717 7723 7727 7741 7753 7757
7759 7789 7793 7817 7823 7829 7841 7853 7867 7873 7877 7879 7883 7901 7907 7919
7927 7933 7937 7949 7951 7963 7993 8009 8011 8017 8039 8053 8059 8069 8081 8087
8089 8093 8101 8111 8117 8123 8147 8161 8167 8171 8179 8191 8209 8219 8221 8231
8233 8237 8243 8263 8269 8273 8287 8291 8293 8297 8311 8317 8329 8353 8363 8369
8377 8387 8389 8419 8423 8429 8431 8443 8447 8461 8467 8501 8513 8521 8527 8537
8539 8543 8563 8573 8581 8597 8599 8609 8623 8627 8629 8641 8647 8663 8669 8677
8681 8689 8693 8699 8707 8713 8719 8731 8737 8741 8747 8753 8761 8779 8783 8803
8807 8819 8821 8831 8837 8839 8849 8861 8863 8867 8887 8893 8923 8929 8933 8941
8951 8963 8969 8971 8999 9001 9007 9011 9013 9029 9041 9043 9049 9059 9067 9091
9103 9109 9127 9133 9137 9151 9157 9161 9173 9181 9187 9199 9203 9209 9221 9227
9239 9241 9257 9277 9281 9283 9293 9311 9319 9323 9337 9341 9343 9349 9371 9377
9391 9397 9403 9413 9419 9421 9431 9433 9437 9439 9461 9463 9467 9473 9479 9491
9497 9511 9521 9533 9539 9547 9551 9587 9601 9613 9619 9623 9629 9631 9643 9649
9661 9677 9679 9689 9697 9719 9721 9733 9739 9743 9749 9767 9769 9781 9787 9791
9803 9811 9817 9829 9833 9839 9851 9857 9859 9871 9883 9887 9901 9907 9923 9929
9931 9941 9949 9967 9973

10007 10009 10037 10039 10061 10067 10069 10079 10091 10093 10099 10103 10111
10133 10139 10141 10151 10159 10163 10169 10177 10181 10193 10211 10223 10243
10247 10253 10259 10267 10271 10273 10289 10301 10303 10313 10321 10331 10333
10337 10343 10357 10369 10391 10399 10427 10429 10433 10453 10457 10459 10463
10477 10487 10499 10501 10513 10529 10531 10559 10567 10589 10597 10601 10607
10613 10627 10631 10639 10651 10657 10663 10667 10687 10691 10709 10711 10723
10729 10733 10739 10753 10771 10781 10789 10799 10831 10837 10847 10853 10859
10861 10867 10883 10889 10891 10903 10909 10937 10939 10949 10957 10973 10979
10987 10993 11003 11027 11047 11057 11059 11069 11071 11083 11087 11093 11113
11117 11119 11131 11149 11159 11161 11171 11173 11177 11197 11213 11239 11243
11251 11257 11261 11273 11279 11287 11299 11311 11317 11321 11329 11351 11353
11369 11383 11393 11399 11411 11423 11437 11443 11447 11467 11471 11483 11489
11491 11497 11503 11519 11527 11549 11551 11579 11587 11593 11597 11617 11621
11633 11657 11677 11681 11689 11699 11701 11717 11719 11731 11743 11777 11779
11783 11789 11801 11807 11813 11821 11827 11831 11833 11839 11863 11867 11887
11897 11903 11909 11923 11927 11933 11939 11941 11953 11959 11969 11971 11981
11987 12007 12011 12037 12041 12043 12049 12071 12073 12097 12101 12107 12109
12113 12119 12143 12149 12157 12161 12163 12197 12203 12211 12227 12239 12241
12251 12253 12263 12269 12277 12281 12289 12301 12323 12329 12343 12347 12373
12377 12379 12391 12401 12409 12413 12421 12433 12437 12451 12457 12473 12479
12487 12491 12497 12503 12511 12517 12527 12539 12541 12547 12553 12569 12577
12583 12589 12601 12611 12613 12619 12637 12641 12647 12653 12659 12671 12689
12697 12703 12713 12721 12739 12743 12757 12763 12781 12791 12799 12809 12821
12823 12829 12841 12853 12889 12893 12899 12907 12911 12917 12919 12923 12941
12953 12959 12967 12973 12979 12983 13001 13003 13007 13009 13033 13037 13043
13049 13063 13093 13099 13103 13109 13121 13127 13147 13151 13159 13163 13171
13177 13183 13187 13217 13219 13229 13241 13249 13259 13267 13291 13297 13309
13313 13327 13331 13337 13339 13367 13381 13397 13399 13411 13417 13421 13441
13451 13457 13463 13469 13477 13487 13499 13513 13523 13537 13553 13567 13577
13591 13597 13613 13619 13627 13633 13649 13669 13679 13681 13687 13691 13693
13697 13709 13711 13721 13723 13729 13751 13757 13759 13763 13781 13789 13799
13807 13829 13831 13841 13859 13873 13877 13879 13883 13901 13903 13907 13913
13921 13931 13933 13963 13967 13997 13999 14009 14011 14029 14033 14051 14057
14071 14081 14083 14087 14107 14143 14149 14153 14159 14173 14177 14197 14207
14221 14243 14249 14251 14281 14293 14303 14321 14323 14327 14341 14347 14369
14387 14389 14401 14407 14411 14419 14423 14431 14437 14447 14449 14461 14479
14489 14503 14519 14533 14537 14543 14549 14551 14557 14561 14563 14591 14593
14621 14627 14629 14633 14639 14653 14657 14669 14683 14699 14713 14717 14723
14731 14737 14741 14747 14753 14759 14767 14771 14779 14783 14797 14813 14821
14827 14831 14843 14851 14867 14869 14879 14887 14891 14897 14923 14929 14939
14947 14951 14957 14969 14983 15013 15017 15031 15053 15061 15073 15077 15083
15091 15101 15107 15121 15131 15137 15139 15149 15161 15173 15187 15193 15199
15217 15227 15233 15241 15259 15263 15269 15271 15277 15287 15289 15299 15307
15313 15319 15329 15331 15349 15359 15361 15373 15377 15383 15391 15401 15413

15427	15439	15443	15451	15461	15467	15473	15493	15497	15511	15527	15541	15551
15559	15569	15581	15583	15601	15607	15619	15629	15641	15643	15647	15649	15661
15667	15671	15679	15683	15727	15731	15733	15737	15739	15749	15761	15767	15773
15787	15791	15797	15803	15809	15817	15823	15859	15877	15881	15887	15889	15901
15907	15913	15919	15923	15937	15959	15971	15973	15991	16001	16007	16033	16057
16061	16063	16067	16069	16073	16087	16091	16097	16103	16111	16127	16139	16141
16183	16187	16189	16193	16217	16223	16229	16231	16249	16253	16267	16273	16301
16319	16333	16339	16349	16361	16363	16369	16381	16411	16417	16421	16427	16433
16447	16451	16453	16477	16481	16487	16493	16519	16529	16547	16553	16561	16567
16573	16603	16607	16619	16631	16633	16649	16651	16657	16661	16673	16691	16693
16699	16703	16729	16741	16747	16759	16763	16787	16811	16823	16829	16831	16843
16871	16879	16883	16889	16901	16903	16921	16927	16931	16937	16943	16963	16979
16981	16987	16993	17011	17021	17027	17029	17033	17041	17047	17053	17077	17093
17099	17107	17117	17123	17137	17159	17167	17183	17189	17191	17203	17207	17209
17231	17239	17257	17291	17293	17299	17317	17321	17327	17333	17341	17351	17359
17377	17383	17387	17389	17393	17401	17417	17419	17431	17443	17449	17467	17471
17477	17483	17489	17491	17497	17509	17519	17539	17551	17569	17573	17579	17581
17597	17599	17609	17623	17627	17657	17659	17669	17681	17683	17707	17713	17729
17737	17747	17749	17761	17783	17789	17791	17807	17827	17837	17839	17851	17863
17881	17891	17903	17909	17911	17921	17923	17929	17939	17957	17959	17971	17977
17981	17987	17989	18013	18041	18043	18047	18049	18059	18061	18077	18089	18097
18119	18121	18127	18131	18133	18143	18149	18169	18181	18191	18199	18211	18217
18223	18229	18233	18251	18253	18257	18269	18287	18289	18301	18307	18311	18313
18329	18341	18353	18367	18371	18379	18397	18401	18413	18427	18433	18439	18443
18451	18457	18461	18481	18493	18503	18517	18521	18523	18539	18541	18553	18583
18587	18593	18617	18637	18661	18671	18679	18691	18701	18713	18719	18731	18743
18749	18757	18773	18787	18793	18797	18803	18839	18859	18869	18899	18911	18913
18917	18919	18947	18959	18973	18979	19001	19009	19013	19031	19037	19051	19069
19073	19079	19081	19087	19121	19139	19141	19157	19163	19181	19183	19207	19211
19213	19219	19231	19237	19249	19259	19267	19273	19289	19301	19309	19319	19333
19373	19379	19381	19387	19391	19403	19417	19421	19423	19427	19429	19433	19441
19447	19457	19463	19469	19471	19477	19483	19489	19501	19507	19531	19541	19543
19553	19559	19571	19577	19583	19597	19603	19609	19661	19681	19687	19697	19699
19709	19717	19727	19739	19751	19753	19759	19763	19777	19793	19801	19813	19819
19841	19843	19853	19861	19867	19889	19891	19913	19919	19927	19937	19949	19961
19963	19973	19979	19991	19993	19997							

20011	20021	20023	20029	20047	20051	20063	20071	20089	20101	20107	20113	20117
20123	20129	20143	20147	20149	20161	20173	20177	20183	20201	20219	20231	20233
20249	20261	20269	20287	20297	20323	20327	20333	20341	20347	20353	20357	20359
20369	20389	20393	20399	20407	20411	20431	20441	20443	20477	20479	20483	20507
20509	20521	20533	20543	20549	20551	20563	20593	20599	20611	20627	20639	20641
20663	20681	20693	20707	20717	20719	20731	20743	20747	20749	20753	20759	20771
20773	20789	20807	20809	20849	20857	20873	20879	20887	20897	20899	20903	20921
20929	20939	20947	20959	20963	20981	20983	21001	21011	21013	21017	21019	21023
21031	21059	21061	21067	21089	21101	21107	21121	21139	21143	21149	21157	21163
21169	21179	21187	21191	21193	21211	21221	21227	21247	21269	21277	21283	21313
21317	21319	21323	21341	21347	21377	21379	21383	21391	21397	21401	21407	21419
21433	21467	21481	21487	21491	21493	21499	21503	21517	21521	21523	21529	21557
21559	21563	21569	21577	21587	21589	21599	21601	21611	21613	21617	21647	21649
21661	21673	21683	21701	21713	21727	21737	21739	21751	21757	21767	21773	21787
21799	21803	21817	21821	21839	21841	21851	21859	21863	21871	21881	21893	21911
21929	21937	21943	21961	21977	21991	21997	22003	22013	22027	22031	22037	22039
22051	22063	22067	22073	22079	22091	22093	22109	22111	22123	22129	22133	22147
22153	22157	22159	22171	22189	22193	22229	22247	22259	22271	22273	22277	22279
22283	22291	22303	22307	22343	22349	22367	22369	22381	22391	22397	22409	22433
22441	22447	22453	22469	22481	22483	22501	22511	22531	22541	22543	22549	22567
22571	22573	22613	22619	22621	22637	22639	22643	22651	22669	22679	22691	22697
22699	22709	22717	22721	22727	22739	22741	22751	22769	22777	22783	22787	22807
22811	22817	22853	22859	22861	22871	22877	22901	22907	22921	22937	22943	22961
22963	22973	22993	23003	23011	23017	23021	23027	23029	23039	23041	23053	23057
23059	23063	23071	23081	23087	23099	23117	23131	23143	23159	23167	23173	23189
23197	23201	23203	23209	23227	23251	23269	23279	23291	23293	23297	23311	23321

23327 23333 23339 23357 23369 23371 23399 23417 23431 23447 23459 23473 23497
23509 23531 23537 23539 23549 23557 23561 23563 23567 23581 23593 23599 23603
23609 23623 23627 23629 23633 23663 23669 23671 23677 23687 23689 23719 23741
23743 23747 23753 23761 23767 23773 23789 23801 23813 23819 23827 23831 23833
23857 23869 23873 23879 23887 23893 23899 23909 23911 23917 23929 23957 23971
23977 23981 23993 24001 24007 24019 24023 24029 24043 24049 24061 24071 24077
24083 24091 24097 24103 24107 24109 24113 24121 24133 24137 24151 24169 24179
24181 24197 24203 24223 24229 24239 24247 24251 24281 24317 24329 24337 24359
24371 24373 24379 24391 24407 24413 24419 24421 24439 24443 24469 24473 24481
24499 24509 24517 24527 24533 24547 24551 24571 24593 24611 24623 24631 24659
24671 24677 24683 24691 24697 24709 24733 24749 24763 24767 24781 24793 24799
24809 24821 24841 24847 24851 24859 24877 24889 24907 24917 24919 24923 24943
24953 24967 24971 24977 24979 24989 25013 25031 25033 25037 25057 25073 25087
25097 25111 25117 25121 25127 25147 25153 25163 25169 25171 25183 25189 25219
25229 25237 25243 25247 25253 25261 25301 25303 25307 25309 25321 25339 25343
25349 25357 25367 25373 25391 25409 25411 25423 25439 25447 25453 25457 25463
25469 25471 25523 25537 25541 25561 25577 25579 25583 25589 25601 25603 25609
25621 25633 25639 25643 25657 25667 25673 25679 25693 25703 25717 25733 25741
25747 25759 25763 25771 25793 25799 25801 25819 25841 25847 25849 25867 25873
25889 25903 25913 25919 25931 25933 25939 25943 25951 25969 25981 25997 25999
26003 26017 26021 26029 26041 26053 26083 26099 26107 26111 26113 26119 26141
26153 26161 26171 26177 26183 26189 26203 26209 26227 26237 26249 26251 26261
26263 26267 26293 26297 26309 26317 26321 26339 26347 26357 26371 26387 26393
26399 26407 26417 26423 26431 26437 26449 26459 26479 26489 26497 26501 26513
26539 26557 26561 26573 26591 26597 26627 26633 26641 26647 26669 26681 26683
26687 26693 26699 26701 26711 26713 26717 26723 26729 26731 26737 26759 26777
26783 26801 26813 26821 26833 26839 26849 26861 26863 26879 26881 26891 26893
26903 26921 26927 26947 26951 26953 26959 26981 26987 26993 27011 27017 27031
27043 27059 27061 27067 27073 27077 27091 27103 27107 27109 27127 27143 27179
27191 27197 27211 27239 27241 27253 27259 27271 27277 27281 27283 27299 27329
27337 27361 27367 27397 27407 27409 27427 27431 27437 27449 27457 27479 27481
27487 27509 27527 27529 27539 27541 27551 27581 27583 27611 27617 27631 27647
27653 27673 27689 27691 27697 27701 27733 27737 27739 27743 27749 27751 27763
27767 27773 27779 27791 27793 27799 27803 27809 27817 27823 27827 27847 27851
27883 27893 27901 27917 27919 27941 27943 27947 27953 27961 27967 27983 27997
28001 28019 28027 28031 28051 28057 28069 28081 28087 28097 28099 28109 28111
28123 28151 28163 28181 28183 28201 28211 28219 28229 28277 28279 28283 28289
28297 28307 28309 28319 28349 28351 28387 28393 28403 28409 28411 28429 28433
28439 28447 28463 28477 28493 28499 28513 28517 28537 28541 28547 28549 28559
28571 28573 28579 28591 28597 28603 28607 28619 28621 28627 28631 28643 28649
28657 28661 28663 28669 28687 28697 28703 28711 28723 28729 28751 28753 28759
28771 28789 28793 28807 28813 28817 28837 28843 28859 28867 28871 28879 28901
28909 28921 28927 28933 28949 28961 28979 29009 29017 29021 29023 29027 29033
29059 29063 29077 29101 29123 29129 29131 29137 29147 29153 29167 29173 29179
29191 29201 29207 29209 29221 29231 29243 29251 29269 29287 29297 29303 29311
29327 29333 29339 29347 29363 29383 29387 29389 29399 29401 29411 29423 29429
29437 29443 29453 29473 29483 29501 29527 29531 29537 29567 29569 29573 29581
29587 29599 29611 29629 29633 29641 29663 29669 29671 29683 29717 29723 29741
29753 29759 29761 29789 29803 29819 29833 29837 29851 29863 29867 29873 29879
29881 29917 29921 29927 29947 29959 29983 29989

30011 30013 30029 30047 30059 30071 30089 30091 30097 30103 30109 30113 30119
30133 30137 30139 30161 30169 30181 30187 30197 30203 30211 30223 30241 30253
30259 30269 30271 30293 30307 30313 30319 30323 30341 30347 30367 30389 30391
30403 30427 30431 30449 30467 30469 30491 30493 30497 30509 30517 30529 30539
30553 30557 30559 30577 30593 30631 30637 30643 30649 30661 30671 30677 30689
30697 30703 30707 30713 30727 30757 30763 30773 30781 30803 30809 30817 30829
30839 30841 30851 30853 30859 30869 30871 30881 30893 30911 30931 30937 30941
30949 30971 30977 30983 31013 31019 31033 31039 31051 31063 31069 31079 31081
31091 31121 31123 31139 31147 31151 31153 31159 31177 31181 31183 31189 31193
31219 31223 31231 31237 31247 31249 31253 31259 31267 31271 31277 31307 31319
31321 31327 31333 31337 31357 31379 31387 31391 31393 31397 31469 31477 31481
31489 31511 31513 31517 31531 31541 31543 31547 31567 31573 31583 31601 31607

31627	31643	31649	31657	31663	31667	31687	31699	31721	31723	31727	31729	31741
31751	31769	31771	31793	31799	31817	31847	31849	31859	31873	31883	31891	31907
31957	31963	31973	31981	31991	32003	32009	32027	32029	32051	32057	32059	32063
32069	32077	32083	32089	32099	32117	32119	32141	32143	32159	32173	32183	32189
32191	32203	32213	32233	32237	32251	32257	32261	32297	32299	32303	32309	32321
32323	32327	32341	32353	32359	32363	32369	32371	32377	32381	32401	32411	32413
32423	32429	32441	32443	32467	32479	32491	32497	32503	32507	32531	32533	32537
32561	32563	32569	32573	32579	32587	32603	32609	32611	32621	32633	32647	32653
32687	32693	32707	32713	32717	32719	32749	32771	32779	32783	32789	32797	32801
32803	32831	32833	32839	32843	32869	32887	32909	32911	32917	32933	32939	32941
32957	32969	32971	32983	32987	32993	32999	33013	33023	33029	33037	33049	33053
33071	33073	33083	33091	33107	33113	33119	33149	33151	33161	33179	33181	33191
33199	33203	33211	33223	33247	33287	33289	33301	33311	33317	33329	33331	33343
33347	33349	33353	33359	33377	33391	33403	33409	33413	33427	33457	33461	33469
33479	33487	33493	33503	33521	33529	33533	33547	33563	33569	33577	33581	33587
33589	33599	33601	33613	33617	33619	33623	33629	33637	33641	33647	33679	33703
33713	33721	33739	33749	33751	33757	33767	33769	33773	33791	33797	33809	33811
33827	33829	33851	33857	33863	33871	33889	33893	33911	33923	33931	33937	33941
33961	33967	33997	34019	34031	34033	34039	34057	34061	34123	34127	34129	34141
34147	34157	34159	34171	34183	34211	34213	34217	34231	34253	34259	34261	34267
34273	34283	34297	34301	34303	34313	34319	34327	34337	34351	34361	34367	34369
34381	34403	34421	34429	34439	34457	34469	34471	34483	34487	34499	34501	34511
34513	34519	34537	34543	34549	34583	34589	34591	34603	34607	34613	34631	34649
34651	34667	34673	34679	34687	34693	34703	34721	34729	34739	34747	34757	34759
34763	34781	34807	34819	34841	34843	34847	34849	34871	34877	34883	34897	34913
34919	34939	34949	34961	34963	34981	35023	35027	35051	35053	35059	35069	35081
35083	35089	35099	35107	35111	35117	35129	35141	35149	35153	35159	35171	35201
35221	35227	35251	35257	35267	35279	35281	35291	35311	35317	35323	35327	35339
35353	35363	35381	35393	35401	35407	35419	35423	35437	35447	35449	35461	35491
35507	35509	35521	35527	35531	35533	35537	35543	35569	35573	35591	35593	35597
35603	35617	35671	35677	35729	35731	35747	35753	35759	35771	35797	35801	35803
35809	35831	35837	35839	35851	35863	35869	35879	35897	35899	35911	35923	35933
35951	35963	35969	35977	35983	35993	35999	36007	36011	36013	36017	36037	36061
36067	36073	36083	36097	36107	36109	36131	36137	36151	36161	36187	36191	36209
36217	36229	36241	36251	36263	36269	36277	36293	36299	36307	36313	36319	36341
36343	36353	36373	36383	36389	36433	36451	36457	36467	36469	36473	36479	36493
36497	36523	36527	36529	36541	36551	36559	36563	36571	36583	36587	36599	36607
36629	36637	36643	36653	36671	36677	36683	36691	36697	36709	36713	36721	36739
36749	36761	36767	36779	36781	36787	36791	36793	36809	36821	36833	36847	36857
36871	36877	36887	36899	36901	36913	36919	36923	36929	36931	36943	36947	36973
36979	36997	37003	37013	37019	37021	37039	37049	37057	37061	37087	37097	37117
37123	37139	37159	37171	37181	37189	37199	37201	37217	37223	37243	37253	37273
37277	37307	37309	37313	37321	37337	37339	37357	37361	37363	37369	37379	37397
37409	37423	37441	37447	37463	37483	37489	37493	37501	37507	37511	37517	37529
37537	37547	37549	37561	37567	37571	37573	37579	37589	37591	37607	37619	37633
37643	37649	37657	37663	37691	37693	37699	37717	37747	37781	37783	37799	37811
37813	37831	37847	37853	37861	37871	37879	37889	37897	37907	37951	37957	37963
37967	37987	37991	37993	37997	38011	38039	38047	38053	38069	38083	38113	38119
38149	38153	38167	38177	38183	38189	38197	38201	38219	38231	38237	38239	38261
38273	38281	38287	38299	38303	38317	38321	38327	38329	38333	38351	38371	38377
38393	38431	38447	38449	38453	38459	38461	38501	38543	38557	38561	38567	38569
38593	38603	38609	38611	38629	38639	38651	38653	38669	38671	38677	38693	38699
38707	38711	38713	38723	38729	38737	38747	38749	38767	38783	38791	38803	38821
38833	38839	38851	38861	38867	38873	38891	38903	38917	38921	38923	38933	38953
38959	38971	38977	38993	39019	39023	39041	39043	39047	39079	39089	39097	39103
39107	39113	39119	39133	39139	39157	39161	39163	39181	39191	39199	39209	39217
39227	39229	39233	39239	39241	39251	39293	39301	39313	39317	39323	39341	39343
39359	39367	39371	39373	39383	39397	39409	39419	39439	39443	39451	39461	39499
39503	39509	39511	39521	39541	39551	39563	39569	39581	39607	39619	39623	39631
39659	39667	39671	39679	39703	39709	39719	39727	39733	39749	39761	39769	39779
39791	39799	39821	39827	39829	39839	39841	39847	39857	39863	39869	39877	39883
39887	39901	39929	39937	39953	39971	39979	39983	39989				

40009 40013 40031 40037 40039 40063 40087 40093 40099 40111 40123 40127 40129
40151 40153 40163 40169 40177 40189 40193 40213 40231 40237 40241 40253 40277
40283 40289 40343 40351 40357 40361 40387 40423 40427 40429 40433 40459 40471
40483 40487 40493 40499 40507 40519 40529 40531 40543 40559 40577 40583 40591
40597 40609 40627 40637 40639 40693 40697 40699 40709 40739 40751 40759 40763
40771 40787 40801 40813 40819 40823 40829 40841 40847 40849 40853 40867 40879
40883 40897 40903 40927 40933 40939 40949 40961 40973 40993 41011 41017 41023
41039 41047 41051 41057 41077 41081 41113 41117 41131 41141 41143 41149 41161
41177 41179 41183 41189 41201 41203 41213 41221 41227 41231 41233 41243 41257
41263 41269 41281 41299 41333 41341 41351 41357 41381 41387 41389 41399 41411
41413 41443 41453 41467 41479 41491 41507 41513 41519 41521 41539 41543 41549
41579 41593 41597 41603 41609 41611 41617 41621 41627 41641 41647 41651 41659
41669 41681 41687 41719 41729 41737 41759 41761 41771 41777 41801 41809 41813
41843 41849 41851 41863 41879 41887 41893 41897 41903 41911 41927 41941 41947
41953 41957 41959 41969 41981 41983 41999 42013 42017 42019 42023 42043 42061
42071 42073 42083 42089 42101 42131 42139 42157 42169 42179 42181 42187 42193
42197 42209 42221 42223 42227 42239 42257 42281 42283 42293 42299 42307 42323
42331 42337 42349 42359 42373 42379 42391 42397 42403 42407 42409 42433 42437
42443 42451 42457 42461 42463 42467 42473 42487 42491 42499 42509 42533 42557
42569 42571 42577 42589 42611 42641 42643 42649 42667 42677 42683 42689 42697
42701 42703 42709 42719 42727 42737 42743 42751 42767 42773 42787 42793 42797
42821 42829 42839 42841 42853 42859 42863 42899 42901 42923 42929 42937 42943
42953 42961 42967 42979 42989 43003 43013 43019 43037 43049 43051 43063 43067
43093 43103 43117 43133 43151 43159 43177 43189 43201 43207 43223 43237 43261
43271 43283 43291 43313 43319 43321 43331 43391 43397 43399 43403 43411 43427
43441 43451 43457 43481 43487 43499 43517 43541 43543 43573 43577 43579 43591
43597 43607 43609 43613 43627 43633 43649 43651 43661 43669 43691 43711 43717
43721 43753 43759 43777 43781 43783 43787 43789 43793 43801 43853 43867 43889
43891 43913 43933 43943 43951 43961 43963 43969 43973 43987 43991 43997 44017
44021 44027 44029 44041 44053 44059 44071 44087 44089 44101 44111 44119 44123
44129 44131 44159 44171 44179 44189 44201 44203 44207 44221 44249 44257 44263
44267 44269 44273 44279 44281 44293 44351 44357 44371 44381 44383 44389 44417
44449 44453 44483 44491 44497 44501 44507 44519 44531 44533 44537 44543 44549
44563 44579 44587 44617 44621 44623 44633 44641 44647 44651 44657 44683 44687
44699 44701 44711 44729 44741 44753 44771 44773 44777 44789 44797 44809 44819
44839 44843 44851 44867 44879 44887 44893 44909 44917 44927 44939 44953 44959
44963 44971 44983 44987 45007 45013 45053 45061 45077 45083 45119 45121 45127
45131 45137 45139 45161 45179 45181 45191 45197 45233 45247 45259 45263 45281
45289 45293 45307 45317 45319 45329 45337 45341 45343 45361 45377 45389 45403
45413 45427 45433 45439 45481 45491 45497 45503 45523 45533 45541 45553 45557
45569 45587 45589 45599 45613 45631 45641 45659 45667 45673 45677 45691 45697
45707 45737 45751 45757 45763 45767 45779 45817 45821 45823 45827 45833 45841
45853 45863 45869 45887 45893 45943 45949 45953 45959 45971 45979 45989 46021
46027 46049 46051 46061 46073 46091 46093 46099 46103 46133 46141 46147 46153
46171 46181 46183 46187 46199 46219 46229 46237 46261 46271 46273 46279 46301
46307 46309 46327 46337 46349 46351 46381 46399 46411 46439 46441 46447 46451
46457 46471 46477 46489 46499 46507 46511 46523 46549 46559 46567 46573 46589
46591 46601 46619 46633 46639 46643 46649 46663 46679 46681 46687 46691 46703
46723 46727 46747 46751 46757 46769 46771 46807 46811 46817 46819 46829 46831
46853 46861 46867 46877 46889 46901 46919 46933 46957 46993 46997 47017 47041
47051 47057 47059 47087 47093 47111 47119 47123 47129 47137 47143 47147 47149
47161 47189 47207 47221 47237 47251 47269 47279 47287 47293 47297 47303 47309
47317 47339 47351 47353 47363 47381 47387 47389 47407 47417 47419 47431 47441
47459 47491 47497 47501 47507 47513 47521 47527 47533 47543 47563 47569 47581
47591 47599 47609 47623 47629 47639 47653 47657 47659 47681 47699 47701 47711
47713 47717 47737 47741 47743 47777 47779 47791 47797 47807 47809 47819 47837
47843 47857 47869 47881 47903 47911 47917 47933 47939 47947 47951 47963 47969
47977 47981 48017 48023 48029 48049 48073 48079 48091 48109 48119 48121 48131
48157 48163 48179 48187 48193 48197 48221 48239 48247 48259 48271 48281 48299
48311 48313 48337 48341 48353 48371 48383 48397 48407 48409 48413 48437 48449
48463 48473 48479 48481 48487 48491 48497 48523 48527 48533 48539 48541 48563
48571 48589 48593 48611 48619 48623 48647 48649 48661 48673 48677 48679 48731
48733 48751 48757 48761 48767 48779 48781 48787 48799 48809 48817 48821 48823

48847 48857 48859 48869 48871 48883 48889 48907 48947 48953 48973 48989 48991
49003 49009 49019 49031 49033 49037 49043 49057 49069 49081 49103 49109 49117
49121 49123 49139 49157 49169 49171 49177 49193 49199 49201 49207 49211 49223
49253 49261 49277 49279 49297 49307 49331 49333 49339 49363 49367 49369 49391
49393 49409 49411 49417 49429 49433 49451 49459 49463 49477 49481 49499 49523
49529 49531 49537 49547 49549 49559 49597 49603 49613 49627 49633 49639 49663
49667 49669 49681 49697 49711 49727 49739 49741 49747 49757 49783 49787 49789
49801 49807 49811 49823 49831 49843 49853 49871 49877 49891 49919 49921 49927
49937 49939 49943 49957 49991 49993 49999

50021 50023 50033 50047 50051 50053 50069 50077 50087 50093 50101 50111 50119
50123 50129 50131 50147 50153 50159 50177 50207 50221 50227 50231 50261 50263
50273 50287 50291 50311 50321 50329 50333 50341 50359 50363 50377 50383 50387
50411 50417 50423 50441 50459 50461 50497 50503 50513 50527 50539 50543 50549
50551 50581 50591 50593 50599 50627 50647 50651 50671 50683 50707 50723
50741 50753 50767 50773 50777 50789 50821 50833 50839 50849 50857 50867 50873
50891 50893 50909 50923 50929 50951 50957 50969 50971 50989 50993 51001 51031
51043 51047 51059 51061 51071 51109 51131 51133 51137 51151 51157 51169 51193
51197 51199 51203 51217 51229 51239 51241 51257 51263 51283 51287 51307 51329
51341 51343 51347 51349 51361 51383 51407 51413 51419 51421 51427 51431 51437
51439 51449 51461 51473 51479 51481 51487 51503 51511 51517 51521 51539 51551
51563 51577 51581 51593 51599 51607 51613 51631 51637 51647 51659 51673 51679
51683 51691 51713 51719 51721 51749 51767 51769 51787 51797 51803 51817 51827
51829 51839 51853 51859 51869 51871 51893 51899 51907 51913 51929 51941 51949
51971 51973 51977 51991 52009 52021 52027 52051 52057 52067 52069 52081 52103
52121 52127 52147 52153 52163 52177 52181 52183 52189 52201 52223 52237 52249
52253 52259 52267 52289 52291 52301 52313 52321 52361 52363 52369 52379 52387
52391 52433 52453 52457 52489 52501 52511 52517 52529 52541 52543 52553 52561
52567 52571 52579 52583 52609 52627 52631 52639 52667 52673 52691 52697 52709
52711 52721 52727 52733 52747 52757 52769 52783 52807 52813 52817 52837 52859
52861 52879 52883 52889 52901 52903 52919 52937 52951 52957 52963 52967 52973
52981 52999 53003 53017 53047 53051 53069 53077 53087 53089 53093 53101 53113
53117 53129 53147 53149 53161 53171 53173 53189 53197 53201 53231 53233 53239
53267 53269 53279 53281 53299 53309 53323 53327 53353 53359 53377 53381 53401
53407 53411 53419 53437 53441 53453 53479 53503 53507 53527 53549 53551 53569
53591 53593 53597 53609 53611 53617 53623 53629 53633 53639 53653 53657 53681
53693 53699 53717 53719 53731 53759 53773 53777 53783 53791 53813 53819 53831
53849 53857 53861 53881 53887 53891 53897 53899 53917 53923 53927 53939 53951
53959 53987 53993 54001 54011 54013 54037 54049 54059 54083 54091 54101 54121
54133 54139 54151 54163 54167 54181 54193 54217 54251 54269 54277 54287 54293
54311 54319 54323 54331 54347 54361 54367 54371 54377 54401 54403 54409 54413
54419 54421 54437 54443 54449 54469 54493 54497 54499 54503 54517 54521 54539
54541 54547 54559 54563 54577 54581 54583 54601 54617 54623 54629 54631 54647
54667 54673 54679 54709 54713 54721 54727 54751 54767 54773 54779 54787 54799
54829 54833 54851 54869 54877 54881 54907 54917 54919 54941 54949 54959 54973
54979 54983 55001 55009 55021 55049 55051 55057 55061 55073 55079 55103 55109
55117 55127 55147 55163 55171 55201 55207 55213 55217 55219 55229 55243 55249
55259 55291 55313 55331 55333 55337 55339 55343 55351 55373 55381 55399 55411
55439 55441 55457 55469 55487 55501 55511 55529 55541 55547 55579 55589 55603
55609 55619 55621 55631 55633 55639 55661 55663 55667 55673 55681 55691 55697
55711 55717 55721 55733 55763 55787 55793 55799 55807 55813 55817 55819 55823
55829 55837 55843 55849 55871 55889 55897 55901 55903 55921 55927 55931 55933
55949 55967 55987 55997 56003 56009 56039 56041 56053 56081 56087 56093 56099
56101 56113 56123 56131 56149 56167 56171 56179 56197 56207 56209 56237 56239
56249 56263 56267 56269 56299 56311 56333 56359 56369 56377 56383 56393 56401
56417 56431 56437 56443 56453 56467 56473 56477 56479 56489 56501 56503 56509
56519 56527 56531 56533 56543 56569 56591 56597 56599 56611 56629 56633 56659
56663 56671 56681 56687 56701 56711 56713 56731 56737 56747 56767 56773 56779
56783 56807 56809 56813 56821 56827 56843 56857 56873 56891 56893 56897 56909
56911 56921 56923 56929 56941 56951 56957 56963 56983 56989 56993 56999 57037
57041 57047 57059 57073 57077 57089 57097 57107 57119 57131 57139 57143 57149
57163 57173 57179 57191 57193 57203 57221 57223 57241 57251 57259 57269 57271
57283 57287 57301 57329 57331 57347 57349 57367 57373 57383 57389 57397 57413

57427 57457 57467 57487 57493 57503 57527 57529 57557 57559 57571 57587 57593
57601 57637 57641 57649 57653 57667 57679 57689 57697 57709 57713 57719 57727
57731 57737 57751 57773 57781 57787 57791 57793 57803 57809 57829 57839 57847
57853 57859 57881 57899 57901 57917 57923 57943 57947 57973 57977 57991 58013
58027 58031 58043 58049 58057 58061 58067 58073 58099 58109 58111 58129 58147
58151 58153 58169 58171 58189 58193 58199 58207 58211 58217 58229 58231 58237
58243 58271 58309 58313 58321 58337 58363 58367 58369 58379 58391 58393 58403
58411 58417 58427 58439 58441 58451 58453 58477 58481 58511 58537 58543 58549
58567 58573 58579 58601 58603 58613 58631 58657 58661 58679 58687 58693 58699
58711 58727 58733 58741 58757 58763 58771 58787 58789 58831 58889 58897 58901
58907 58909 58913 58921 58937 58943 58963 58967 58979 58991 58997 59009 59011
59021 59023 59029 59051 59053 59063 59069 59077 59083 59093 59107 59113 59119
59123 59141 59149 59159 59167 59183 59197 59207 59209 59219 59221 59233 59239
59243 59263 59273 59281 59333 59341 59351 59357 59359 59369 59377 59387 59393
59399 59407 59417 59419 59441 59443 59447 59453 59467 59471 59473 59497 59509
59513 59539 59557 59561 59567 59581 59611 59617 59621 59627 59629 59651 59659
59663 59669 59671 59693 59699 59707 59723 59729 59743 59747 59753 59771 59779
59791 59797 59809 59833 59863 59879 59887 59921 59929 59951 59957 59971 59981
59999
60013 60017 60029 60037 60041 60077 60083 60089 60091 60101 60103 60107 60127
60133 60139 60149 60161 60167 60169 60209 60217 60223 60251 60257 60259 60271
60289 60293 60317 60331 60337 60343 60353 60373 60383 60397 60413 60427 60443
60449 60457 60493 60497 60509 60521 60527 60539 60589 60601 60607 60611 60617
60623 60631 60637 60647 60649 60659 60661 60679 60689 60703 60719 60727 60733
60737 60757 60761 60763 60773 60779 60793 60811 60821 60859 60869 60887 60889
60899 60901 60913 60917 60919 60923 60937 60943 60953 60961 61001 61007 61027
61031 61043 61051 61057 61091 61099 61121 61129 61141 61151 61153 61169 61211
61223 61231 61253 61261 61283 61291 61297 61331 61333 61339 61343 61357 61363
61379 61381 61403 61409 61417 61441 61463 61469 61471 61483 61487 61493 61507
61511 61519 61543 61547 61553 61559 61561 61583 61603 61609 61613 61627 61631
61637 61643 61651 61657 61667 61673 61681 61687 61703 61717 61723 61729 61751
61757 61781 61813 61819 61837 61843 61861 61871 61879 61909 61927 61933 61949
61961 61967 61979 61981 61987 61991 62003 62011 62017 62039 62047 62053 62057
62071 62081 62099 62119 62129 62131 62137 62141 62143 62171 62189 62191 62201
62207 62213 62219 62233 62273 62297 62299 62303 62311 62323 62327 62347 62351
62383 62401 62417 62423 62459 62467 62473 62477 62483 62497 62501 62507 62533
62539 62549 62563 62581 62591 62597 62603 62617 62627 62633 62639 62653 62659
62683 62687 62701 62723 62731 62743 62753 62761 62773 62791 62801 62819 62827
62851 62861 62869 62873 62897 62903 62921 62927 62929 62939 62969 62971 62981
62983 62987 62989 63029 63031 63059 63067 63073 63079 63097 63103 63113 63127
63131 63149 63179 63197 63199 63211 63241 63247 63277 63281 63299 63311 63313
63317 63331 63337 63347 63353 63361 63367 63377 63389 63391 63397 63409 63419
63421 63439 63443 63463 63467 63473 63487 63493 63499 63521 63527 63533 63541
63559 63577 63587 63589 63599 63601 63607 63611 63617 63629 63647 63649 63659
63667 63671 63689 63691 63697 63703 63709 63719 63727 63737 63743 63761 63773
63781 63793 63799 63803 63809 63823 63839 63841 63853 63857 63863 63901 63907
63913 63929 63949 63977 63997 64007 64013 64019 64033 64037 64063 64067 64081
64091 64109 64123 64151 64153 64157 64171 64187 64189 64217 64223 64231 64237
64271 64279 64283 64301 64303 64319 64327 64333 64373 64381 64399 64403 64433
64439 64451 64453 64483 64489 64499 64513 64553 64567 64577 64579 64591 64601
64609 64613 64621 64627 64633 64661 64663 64667 64679 64693 64709 64717 64747
64763 64781 64783 64793 64811 64817 64849 64853 64871 64877 64879 64891 64901
64919 64921 64927 64937 64951 64969 64997 65003 65011 65027 65029 65033 65053
65063 65071 65089 65099 65101 65111 65119 65123 65129 65141 65147 65167 65171
65173 65179 65183 65203 65213 65239 65257 65267 65269 65287 65293 65309 65323
65327 65353 65357 65371 65381 65393 65407 65413 65419 65423 65437 65447 65449
65479 65497 65519 65521 65537 65539 65543 65551 65557 65563 65579 65581 65587
65599 65609 65617 65629 65633 65647 65651 65657 65677 65687 65699 65701 65707
65713 65717 65719 65729 65731 65761 65777 65789 65809 65827 65831 65837 65839
65843 65851 65867 65881 65899 65921 65927 65929 65951 65957 65963 65981 65983
65993 66029 66037 66041 66047 66067 66071 66083 66089 66103 66107 66109 66137
66161 66169 66173 66179 66191 66221 66239 66271 66293 66301 66337 66343 66347
66359 66361 66373 66377 66383 66403 66413 66431 66449 66457 66463 66467 66491

66499 66509 66523 66529 66533 66541 66553 66569 66571 66587 66593 66601 66617
66629 66643 66653 66683 66697 66701 66713 66721 66733 66739 66749 66751 66763
66791 66797 66809 66821 66841 66851 66853 66863 66877 66883 66889 66919 66923
66931 66943 66947 66949 66959 66973 66977 67003 67021 67033 67043 67049 67057
67061 67073 67079 67103 67121 67129 67139 67141 67153 67157 67169 67181 67187
67189 67211 67213 67217 67219 67231 67247 67261 67271 67273 67289 67307 67339
67343 67349 67369 67391 67399 67409 67411 67421 67427 67429 67433 67447 67453
67477 67481 67489 67493 67499 67511 67523 67531 67537 67547 67559 67567 67577
67579 67589 67601 67607 67619 67631 67651 67679 67699 67709 67723 67733 67741
67751 67757 67759 67763 67777 67783 67789 67801 67807 67819 67829 67843 67853
67867 67883 67891 67901 67927 67931 67933 67939 67943 67957 67961 67967 67979
67987 67993 68023 68041 68053 68059 68071 68087 68099 68111 68113 68141 68147
68161 68171 68207 68209 68213 68219 68227 68239 68261 68279 68281 68311 68329
68351 68371 68389 68399 68437 68443 68447 68449 68473 68477 68483 68489 68491
68501 68507 68521 68531 68539 68543 68567 68581 68597 68611 68633 68639 68659
68669 68683 68687 68699 68711 68713 68729 68737 68743 68749 68767 68771 68777
68791 68813 68819 68821 68863 68879 68881 68891 68897 68899 68903 68909 68917
68927 68947 68963 68993 69001 69011 69019 69029 69031 69061 69067 69073 69109
69119 69127 69143 69149 69151 69163 69191 69193 69197 69203 69221 69233 69239
69247 69257 69259 69263 69313 69317 69337 69341 69371 69379 69383 69389 69401
69403 69427 69431 69439 69457 69463 69467 69473 69481 69491 69493 69497 69499
69539 69557 69593 69623 69653 69661 69677 69691 69697 69709 69737 69739 69761
69763 69767 69779 69809 69821 69827 69829 69833 69847 69857 69859 69877 69899
69911 69929 69931 69941 69959 69991 69997

70001 70003 70009 70019 70039 70051 70061 70067 70079 70099 70111 70117 70121
70123 70139 70141 70157 70163 70177 70181 70183 70199 70201 70207 70223 70229
70237 70241 70249 70271 70289 70297 70309 70313 70321 70327 70351 70373 70379
70381 70393 70423 70429 70439 70451 70457 70459 70481 70487 70489 70501 70507
70529 70537 70549 70571 70573 70583 70589 70607 70619 70621 70627 70639 70657
70663 70667 70687 70709 70717 70729 70753 70769 70783 70793 70823 70841 70843
70849 70853 70867 70877 70879 70891 70901 70913 70919 70921 70937 70949 70951
70957 70969 70979 70981 70991 70997 70999 71011 71023 71039 71059 71069 71081
71089 71119 71129 71143 71147 71153 71161 71167 71171 71191 71209 71233 71237
71249 71257 71261 71263 71287 71293 71317 71327 71329 71333 71339 71341 71347
71353 71359 71363 71387 71389 71399 71411 71413 71419 71429 71437 71443 71453
71471 71473 71479 71483 71503 71527 71537 71549 71551 71563 71569 71593 71597
71633 71647 71663 71671 71693 71699 71707 71711 71713 71719 71741 71761 71777
71789 71807 71809 71821 71837 71843 71849 71861 71867 71879 71881 71887 71899
71909 71917 71933 71941 71947 71963 71971 71983 71987 71993 71999 72019 72031
72043 72047 72053 72073 72077 72089 72091 72101 72103 72109 72139 72161 72167
72169 72173 72211 72221 72223 72227 72229 72251 72253 72269 72271 72277 72287
72307 72313 72337 72341 72353 72367 72379 72383 72421 72431 72461 72467 72469
72481 72493 72497 72503 72533 72547 72551 72559 72577 72613 72617 72623 72643
72647 72649 72661 72671 72673 72679 72689 72701 72707 72719 72727 72733 72739
72763 72767 72797 72817 72823 72859 72869 72871 72883 72889 72893 72901 72907
72911 72923 72931 72937 72949 72953 72959 72973 72977 72997 73009 73013 73019
73037 73039 73043 73061 73063 73079 73091 73121 73127 73133 73141 73181 73189
73237 73243 73259 73277 73291 73303 73309 73327 73331 73351 73361 73363 73369
73379 73387 73417 73421 73433 73453 73459 73471 73477 73483 73517 73523 73529
73547 73553 73561 73571 73583 73589 73597 73607 73609 73613 73637 73643 73651
73673 73679 73681 73693 73699 73709 73721 73727 73751 73757 73771 73783 73819
73823 73847 73849 73859 73867 73877 73883 73897 73907 73939 73943 73951 73961
73973 73999 74017 74021 74027 74047 74051 74071 74077 74093 74099 74101 74131
74143 74149 74159 74161 74167 74177 74189 74197 74201 74203 74209 74219 74231
74257 74279 74287 74293 74297 74311 74317 74323 74353 74357 74363 74377 74381
74383 74411 74413 74419 74441 74449 74453 74471 74489 74507 74509 74521 74527
74531 74551 74561 74567 74573 74587 74597 74609 74611 74623 74653 74687 74699
74707 74713 74717 74719 74729 74731 74747 74759 74761 74771 74779 74797 74821
74827 74831 74843 74857 74861 74869 74873 74887 74891 74897 74903 74923 74929
74933 74941 74959 75011 75013 75017 75029 75037 75041 75079 75083 75109 75133
75149 75161 75167 75169 75181 75193 75209 75211 75217 75223 75227 75239 75253
75269 75277 75289 75307 75323 75329 75337 75347 75353 75367 75377 75389 75391

75401 75403 75407 75431 75437 75479 75503 75511 75521 75527 75533 75539 75541
75553 75557 75571 75577 75583 75611 75617 75619 75629 75641 75653 75659 75679
75683 75689 75703 75707 75709 75721 75731 75743 75767 75773 75781 75787 75793
75797 75821 75833 75853 75869 75883 75913 75931 75937 75941 75967 75979 75983
75989 75991 75997 76001 76003 76031 76039 76079 76081 76091 76099 76103 76123
76129 76147 76157 76159 76163 76207 76213 76231 76243 76249 76253 76259 76261
76283 76289 76303 76333 76343 76367 76369 76379 76387 76403 76421 76423 76441
76463 76471 76481 76487 76493 76507 76511 76519 76537 76541 76543 76561 76579
76597 76603 76607 76631 76649 76651 76667 76673 76679 76697 76717 76733 76753
76757 76771 76777 76781 76801 76819 76829 76831 76837 76847 76871 76873 76883
76907 76913 76919 76943 76949 76961 76963 76991 77003 77017 77023 77029 77041
77047 77069 77081 77093 77101 77137 77141 77153 77167 77171 77191 77201 77213
77237 77239 77243 77249 77261 77263 77267 77269 77279 77291 77317 77323 77339
77347 77351 77359 77369 77377 77383 77417 77419 77431 77447 77471 77477 77479
77489 77491 77509 77513 77521 77527 77543 77549 77551 77557 77563 77569 77573
77587 77591 77611 77617 77621 77641 77647 77659 77681 77687 77689 77699 77711
77713 77719 77723 77731 77743 77747 77761 77773 77783 77797 77801 77813 77839
77849 77863 77867 77893 77899 77929 77933 77951 77969 77977 77983 77999 78007
78017 78031 78041 78049 78059 78079 78101 78121 78137 78139 78157 78163 78167
78173 78179 78191 78193 78203 78229 78233 78241 78259 78277 78283 78301 78307
78311 78317 78341 78347 78367 78401 78427 78437 78439 78467 78479 78487 78497
78509 78511 78517 78539 78541 78553 78569 78571 78577 78583 78593 78607 78623
78643 78649 78653 78691 78697 78707 78713 78721 78737 78779 78781 78787 78791
78797 78803 78809 78823 78839 78853 78857 78877 78887 78889 78893 78901 78919
78929 78941 78977 78979 78989 79031 79039 79043 79063 79087 79103 79111 79133
79139 79147 79151 79153 79159 79181 79187 79193 79201 79229 79231 79241 79259
79273 79279 79283 79301 79309 79319 79333 79337 79349 79357 79367 79379 79393
79397 79399 79411 79423 79427 79433 79451 79481 79493 79531 79537 79549 79559
79561 79579 79589 79601 79609 79613 79621 79627 79631 79633 79657 79669 79687
79691 79693 79697 79699 79757 79769 79777 79801 79811 79813 79817 79823 79829
79841 79843 79847 79861 79867 79873 79889 79901 79903 79907 79939 79943 79967
79973 79979 79987 79997 79999

80021 80039 80051 80071 80077 80107 80111 80141 80147 80149 80153 80167 80173
80177 80191 80207 80209 80221 80231 80233 80239 80251 80263 80273 80279 80287
80309 80317 80329 80341 80347 80363 80369 80387 80407 80429 80447 80449 80471
80473 80489 80491 80513 80527 80537 80557 80567 80599 80603 80611 80621 80627
80629 80651 80657 80669 80671 80677 80681 80683 80687 80701 80713 80737 80747
80749 80761 80777 80779 80783 80789 80803 80809 80819 80831 80833 80849 80863
80897 80909 80911 80917 80923 80929 80933 80953 80963 80989 81001 81013 81017
81019 81023 81031 81041 81043 81047 81049 81071 81077 81083 81097 81101 81119
81131 81157 81163 81173 81181 81197 81199 81203 81223 81233 81239 81281 81283
81293 81299 81307 81331 81343 81349 81353 81359 81371 81373 81401 81409 81421
81439 81457 81463 81509 81517 81527 81533 81547 81551 81553 81559 81563 81569
81611 81619 81629 81637 81647 81649 81667 81671 81677 81689 81701 81703 81707
81727 81737 81749 81761 81769 81773 81799 81817 81839 81847 81853 81869 81883
81899 81901 81919 81929 81931 81937 81943 81953 81967 81971 81973 82003 82007
82009 82013 82021 82031 82037 82039 82051 82067 82073 82129 82139 82141 82153
82163 82171 82183 82189 82193 82207 82217 82219 82223 82231 82237 82241 82261
82267 82279 82301 82307 82339 82349 82351 82361 82373 82387 82393 82421 82457
82463 82469 82471 82483 82487 82493 82499 82507 82529 82531 82549 82559 82561
82567 82571 82591 82601 82609 82613 82619 82633 82651 82657 82699 82721 82723
82727 82729 82757 82759 82763 82781 82787 82793 82799 82811 82813 82837 82847
82883 82889 82891 82903 82913 82939 82963 82981 82997 83003 83009 83023 83047
83059 83063 83071 83077 83089 83093 83101 83117 83137 83177 83203 83207 83219
83221 83227 83231 83233 83243 83257 83267 83269 83273 83299 83311 83339 83341
83357 83383 83389 83399 83401 83407 83417 83423 83431 83437 83443 83449 83459
83471 83477 83497 83537 83557 83561 83563 83579 83591 83597 83609 83617 83621
83639 83641 83653 83663 83689 83701 83717 83719 83737 83761 83773 83777 83791
83813 83833 83843 83857 83869 83873 83891 83903 83911 83921 83933 83939 83969
83983 83987 84011 84017 84047 84053 84059 84061 84067 84089 84121 84127 84131
84137 84143 84163 84179 84181 84191 84199 84211 84221 84223 84229 84239 84247
84263 84299 84307 84313 84317 84319 84347 84349 84377 84389 84391 84401 84407

84421	84431	84437	84443	84449	84457	84463	84467	84481	84499	84503	84509	84521
84523	84533	84551	84559	84589	84629	84631	84649	84653	84659	84673	84691	84697
84701	84713	84719	84731	84737	84751	84761	84787	84793	84809	84811	84827	84857
84859	84869	84871	84913	84919	84947	84961	84967	84977	84979	84991	85009	85021
85027	85037	85049	85061	85081	85087	85091	85093	85103	85109	85121	85133	85147
85159	85193	85199	85201	85213	85223	85229	85237	85243	85247	85259	85297	85303
85313	85331	85333	85361	85363	85369	85381	85411	85427	85429	85439	85447	85451
85453	85469	85487	85513	85517	85523	85531	85549	85571	85577	85597	85601	85607
85619	85621	85627	85639	85643	85661	85667	85669	85691	85703	85711	85717	85733
85751	85781	85793	85817	85819	85829	85831	85837	85843	85847	85853	85889	85903
85909	85931	85933	85991	85999	86011	86017	86027	86029	86069	86077	86083	86111
86113	86117	86131	86137	86143	86161	86171	86179	86183	86197	86201	86209	86239
86243	86249	86257	86263	86269	86287	86291	86293	86297	86311	86323	86341	86351
86353	86357	86369	86371	86381	86389	86399	86413	86423	86441	86453	86461	86467
86477	86491	86501	86509	86531	86533	86539	86561	86573	86579	86587	86599	86627
86629	86677	86689	86693	86711	86719	86729	86743	86753	86767	86771	86783	86813
86837	86843	86851	86857	86861	86869	86923	86927	86929	86939	86951	86959	86969
86981	86993	87011	87013	87037	87041	87049	87071	87083	87103	87107	87119	87121
87133	87149	87151	87179	87181	87187	87211	87221	87223	87251	87253	87257	87277
87281	87293	87299	87313	87317	87323	87337	87359	87383	87403	87407	87421	87427
87433	87443	87473	87481	87491	87509	87511	87517	87523	87539	87541	87547	87553
87557	87559	87583	87587	87589	87613	87623	87629	87631	87641	87643	87649	87671
87679	87683	87691	87697	87701	87719	87721	87739	87743	87751	87767	87793	87797
87803	87811	87833	87853	87869	87877	87881	87887	87911	87917	87931	87943	87959
87961	87973	87977	87991	88001	88003	88007	88019	88037	88069	88079	88093	88117
88129	88169	88177	88211	88223	88237	88241	88259	88261	88289	88301	88321	88327
88337	88339	88379	88397	88411	88423	88427	88463	88469	88471	88493	88499	88513
88523	88547	88589	88591	88607	88609	88643	88651	88657	88661	88663	88667	88681
88721	88729	88741	88747	88771	88789	88793	88799	88801	88807	88811	88813	88817
88819	88843	88853	88861	88867	88873	88883	88897	88903	88919	88937	88951	88969
88993	88997	89003	89009	89017	89021	89041	89051	89057	89069	89071	89083	89087
89101	89107	89113	89119	89123	89137	89153	89189	89203	89209	89213	89227	89231
89237	89261	89269	89273	89293	89303	89317	89329	89363	89371	89381	89387	89393
89399	89413	89417	89431	89443	89449	89459	89477	89491	89501	89513	89519	89521
89527	89533	89561	89563	89567	89591	89597	89599	89603	89611	89627	89633	89653
89657	89659	89669	89671	89681	89689	89753	89759	89767	89779	89783	89797	89809
89819	89821	89833	89839	89849	89867	89891	89897	89899	89909	89917	89923	89939
89959	89963	89977	89983	89989								

90001	90007	90011	90017	90019	90023	90031	90053	90059	90067	90071	90073	90089
90107	90121	90127	90149	90163	90173	90187	90191	90197	90199	90203	90217	90227
90239	90247	90263	90271	90281	90289	90313	90353	90359	90371	90373	90379	90397
90401	90403	90407	90437	90439	90469	90473	90481	90499	90511	90523	90527	90529
90533	90547	90583	90599	90617	90619	90631	90641	90647	90659	90677	90679	90697
90703	90709	90731	90749	90787	90793	90803	90821	90823	90833	90841	90847	90863
90887	90901	90907	90911	90917	90931	90947	90971	90977	90989	90997	91009	91019
91033	91079	91081	91097	91099	91121	91127	91129	91139	91141	91151	91153	91159
91163	91183	91193	91199	91229	91237	91243	91249	91253	91283	91291	91297	91303
91309	91331	91367	91369	91373	91381	91387	91393	91397	91411	91423	91433	91453
91457	91459	91463	91493	91499	91513	91529	91541	91571	91573	91577	91583	91591
91621	91631	91639	91673	91691	91703	91711	91733	91753	91757	91771	91781	91801
91807	91811	91813	91823	91837	91841	91867	91873	91909	91921	91939	91943	91951
91957	91961	91967	91969	91997	92003	92009	92033	92041	92051	92077	92083	92107
92111	92119	92143	92153	92173	92177	92179	92189	92203	92219	92221	92227	92233
92237	92243	92251	92269	92297	92311	92317	92333	92347	92353	92357	92363	92369
92377	92381	92383	92387	92399	92401	92413	92419	92431	92459	92461	92467	92479
92489	92503	92507	92551	92557	92567	92569	92581	92593	92623	92627	92639	92641
92647	92657	92669	92671	92681	92683	92693	92699	92707	92717	92723	92737	92753
92761	92767	92779	92789	92791	92801	92809	92821	92831	92849	92857	92861	92863
92867	92893	92899	92921	92927	92941	92951	92957	92959	92987	92993	93001	93047
93053	93059	93077	93083	93089	93097	93103	93113	93131	93133	93139	93151	93169
93179	93187	93199	93229	93239	93241	93251	93253	93257	93263	93281	93283	93287
93307	93319	93323	93329	93337	93371	93377	93383	93407	93419	93427	93463	93479

93481 93487 93491 93493 93497 93503 93523 93529 93553 93557 93559 93563 93581
93601 93607 93629 93637 93683 93701 93703 93719 93739 93761 93763 93787 93809
93811 93827 93851 93871 93887 93889 93893 93901 93911 93913 93923 93937 93941
93949 93967 93971 93979 93983 93997 94007 94009 94033 94049 94057 94063 94079
94099 94109 94111 94117 94121 94151 94153 94169 94201 94207 94219 94229 94253
94261 94273 94291 94307 94309 94321 94327 94331 94343 94349 94351 94379 94397
94399 94421 94427 94433 94439 94441 94447 94463 94477 94483 94513 94529 94531
94541 94543 94547 94559 94561 94573 94583 94597 94603 94613 94621 94649 94651
94687 94693 94709 94723 94727 94747 94771 94777 94781 94789 94793 94811 94819
94823 94837 94841 94847 94849 94873 94889 94903 94907 94933 94949 94951 94961
94993 94999 95003 95009 95021 95027 95063 95071 95083 95087 95089 95093 95101
95107 95111 95131 95143 95153 95177 95189 95191 95203 95213 95219 95231 95233
95239 95257 95261 95267 95273 95279 95287 95311 95317 95327 95339 95369 95383
95393 95401 95413 95419 95429 95441 95443 95461 95467 95471 95479 95483 95507
95527 95531 95539 95549 95561 95569 95581 95597 95603 95617 95621 95629 95633
95651 95701 95707 95713 95717 95723 95731 95737 95747 95773 95783 95789 95791
95801 95803 95813 95819 95857 95869 95873 95881 95891 95911 95917 95923 95929
95947 95957 95959 95971 95987 95989 96001 96013 96017 96043 96053 96059 96079
96097 96137 96149 96157 96167 96179 96181 96199 96211 96221 96223 96233 96259
96263 96269 96281 96289 96293 96323 96329 96331 96337 96353 96377 96401 96419
96431 96443 96451 96457 96461 96469 96479 96487 96493 96497 96517 96527 96553
96557 96581 96587 96589 96601 96643 96661 96667 96671 96697 96703 96731 96737
96739 96749 96757 96763 96769 96779 96787 96797 96799 96821 96823 96827 96847
96851 96857 96893 96907 96911 96931 96953 96959 96973 96979 96989 96997 97001
97003 97007 97021 97039 97073 97081 97103 97117 97127 97151 97157 97159 97169
97171 97177 97187 97213 97231 97241 97259 97283 97301 97303 97327 97367 97369
97373 97379 97381 97387 97397 97423 97429 97441 97453 97459 97463 97499 97501
97511 97523 97547 97549 97553 97561 97571 97577 97579 97583 97607 97609 97613
97649 97651 97673 97687 97711 97729 97771 97777 97787 97789 97813 97829 97841
97843 97847 97849 97859 97861 97871 97879 97883 97919 97927 97931 97943 97961
97967 97973 97987 98009 98011 98017 98041 98047 98057 98081 98101 98123 98129
98143 98179 98207 98213 98221 98227 98251 98257 98269 98297 98299 98317 98321
98323 98327 98347 98369 98377 98387 98389 98407 98411 98419 98429 98443 98453
98459 98467 98473 98479 98491 98507 98519 98533 98543 98561 98563 98573 98597
98621 98627 98639 98641 98663 98669 98689 98711 98713 98717 98729 98731 98737
98773 98779 98801 98807 98809 98837 98849 98867 98869 98873 98887 98893 98897
98899 98909 98911 98927 98929 98939 98947 98953 98963 98981 98993 98999 99013
99017 99023 99041 99053 99079 99083 99089 99103 99109 99119 99131 99133 99137
99139 99149 99173 99181 99191 99223 99233 99241 99251 99257 99259 99277 99289
99317 99347 99349 99367 99371 99377 99391 99397 99401 99409 99431 99439 99469
99487 99497 99523 99527 99529 99551 99559 99563 99571 99577 99581 99607 99611
99623 99643 99661 99667 99679 99689 99707 99709 99713 99719 99721 99733 99761
99767 99787 99793 99809 99817 99823 99829 99833 99839 99859 99871 99877 99881
99901 99907 99923 99929 99961 99971 99989 99991

Formule

$$11^2 = 121$$

$$12^2 = 144$$

$$13^2 = 169$$

$$14^2 = 196$$

$$15^2 = 225$$

$$16^2 = 256$$

$$17^2 = 289$$

$$18^2 = 324$$

$$19^2 = 361$$

$$20^2 = 400$$

$$\textcircled{21}^2 = 441$$

$$22^2 = 484$$

$$23^2 = 529$$

$$24^2 = 576$$

$$25^2 = 625$$

$$26^2 = 676$$

$$27^2 = 729$$

$$28^2 = 784$$

$$29^2 = 841$$

$$\textcircled{30}^2 = 961$$

$$31^2 = 1024$$

$$32^2 = 1089$$

$$33^2 = 1156$$

$$34^2 = 1225$$

$$35^2 = 1296$$

$$36^2 = 1369$$

$$37^2 = 1444$$

$$38^2 = 1521$$

$$39^2 = 1681$$

$$40^2 = 1764$$

$$41^2 = 1849$$

$$44^2 = 1936$$

$$45^2 = 2025$$

$$46^2 = 2116$$

$$47^2 = 2209$$

$$48^2 = 2304$$

$$49^2 = 2401$$

$$51^2 = 2601$$

$$52^2 = 2704$$

$$53^2 = 2809$$

$$54^2 = 2916$$

$$55^2 = 3025$$

$$56^2 = 3136$$

$$57^2 = 3249$$

$$58^2 = 3364$$

$$59^2 = 3481$$

$$60^2 = 3600$$

$$61^2 = 3721$$

$$62^2 = 3844$$

$$63^2 = 3969$$

$$64^2 = 4096$$

$$65^2 = 4225$$

$$66^2 = 4356$$

$$67^2 = 4489$$

$$68^2 = 4624$$

$$69^2 = 4761$$

$$70^2 = 4900$$

$$71^2 = 5041$$

$$72^2 = 5184$$

$$73^2 = 5329$$

$$74^2 = 5476$$

$$75^2 = 5625$$

$$76^2 = 5776$$

$$77^2 = 5929$$

$$78^2 = 6084$$

$$\sqrt{79^2 = 6241}$$

$$\sqrt{80^2 = 6861}$$

$$\sqrt{82^2 = 6724}$$

$$\sqrt{83^2 = 6889}$$

$$\sqrt{84^2 = 7056}$$

$$\sqrt{86^2 = 7225}$$

$$\sqrt{87^2 = 7396}$$

$$\sqrt{88^2 = 7744}$$

$$\sqrt{89^2 = 7921}$$

$$\sqrt{91^2 = 8281}$$

$$\sqrt{92^2 = 8464}$$

$$\sqrt{93^2 = 8649}$$

$$\sqrt{94^2 = 8836}$$

$$\sqrt{95^2 = 9025}$$

$$\sqrt{96^2 = 9216}$$

$$\sqrt{97^2 = 9409}$$

$$\sqrt{98^2 = 9604}$$

$$\sqrt{101^2 = 10201}$$

$$\sqrt{102^2 = 10404}$$

$$\sqrt{103^2 = 10609}$$

$$\sqrt{104^2 = 10816}$$

$$\sqrt{105^2 = 11025}$$

$$\sqrt{106^2 = 11236}$$

$$\sqrt{107^2 = 11449}$$

$$\sqrt{108^2 = 11664}$$

$$\sqrt{109^2 = 11881}$$

$$\sqrt{110^2 = 12100}$$

$$\sqrt{111^2 = 12321}$$

$$\sqrt{112^2 = 12544}$$

$$\sqrt{113^2 = 12769}$$

$$\sqrt{114^2 = 12996}$$

$$\sqrt{115^2 = 13225}$$



$$2^3 = 8; 2^4 = 16; 2^5 = 32; 2^6 = 64; 2^7 = 128; 2^8 = 256; 2^9 = 512; 2^{10} = 1024$$

$$3^3 = 9; 3^4 = 81; 3^5 = 243; 3^6 = 729; 3^7 = 2187; 3^8 = 6561; 3^9 = 19683;$$

$$4^3 = 64; 4^4 = 256; 4^5 = 1024; 4^6 = 4096; 4^7 = 16384; 4^8 = 65536$$

$$5^3 = 125; 5^4 = 625; 5^5 = 3125; 5^6 = 15625; 5^7 = 78125; 5^8 = 390625$$

$$6^3 = 216; 6^4 = 1296; 6^5 = 7776; 6^6 = 46656; 6^7 = 279936; 6^8 = 1679616$$

$$7^3 = 343; 7^4 = 2401; 7^5 = 16807; 7^6 = 117649; 7^7 = 823543; 7^8 = 576481$$

$$8^3 = 512; 8^4 = 4096; 8^5 = 32768; 8^6 = 262144; 8^7 = 2097152; 8^8 = 16777216$$

$$9^3 = 729; 9^4 = 6561; 9^5 = 59049; 9^6 = 531441; 9^7 = 4782969; 9^8 = 4304672$$

$$10^3 = 1000; 10^4 = 10000; 10^5 = 100,000; 10^6 = 1000,000$$

$$2021 = 43 \cdot 47; 2020 = 2^2 \cdot 5 \cdot 101$$

$$1001 = 7 \times 11 \times 13$$

$$2019 = 673 \cdot 3; 2022 = 2 \cdot 3 \cdot 337$$

$$2929 = 29 \times 101$$

$$2023 = 1009 \cdot 2; 2023 = 7 \cdot 17^2$$

$$23600 = 2^3 \times (3 \times 5)^2 \times 51$$

$$2017 - \text{prim}$$

$$261000 = 2^3 \times 3^2 \times 5^3 \times 29$$

$$2016 = 2^5 \cdot 3^2 \cdot 7$$

$$1716 = 2^2 \cdot 3 \cdot 11 \cdot 13$$

$$2015 = 5 \cdot 13 \cdot 31$$

$$2026 = 2 \cdot 1013$$

$$2014 = 2 \cdot 19 \cdot 53$$

$$2013 = 3 \cdot 11 \cdot 61$$

$$2012 = 2^2 \cdot 503$$

$$2011 - \text{prim}$$

$$2010 = 2 \cdot 3 \cdot 5 \cdot 67$$

$$2009 = 7^2 \cdot 41$$

$$2008 = 2^3 \cdot 251$$

$$2007 = 3^2 \cdot 223$$

$$2006 = 2 \cdot 17 \cdot 59$$

$$2005 = 5 \cdot 401$$

$$2004 = 2^2 \cdot 3 \cdot 167$$

$$2003 - \text{prim}$$

$$2002 = 2 \cdot 7 \cdot 11 \cdot 13$$

$$2001 = 3 \cdot \cancel{23} \cdot 29$$

$$\underline{2000 = 2 \cdot 3 \cdot 667}$$

$$1999 - \text{prim}$$

$$1998 = 2 \cdot 3^2 \cdot 37$$

$$1997 - \text{prim}$$

$$1996 = 2 \cdot 499$$

$$1995 = 3 \cdot 5 \cdot 7 \cdot 19$$

$$1994 = 2 \cdot 997$$

$$1993 - \text{prim}$$

Prime perfect

-1-

$$11^2 = 121 \quad 44^2 = 1936$$

$$12^2 = 144 \quad 45^2 = 2025$$

$$13^2 = 169 \quad 46^2 = 2116$$

$$14^2 = 196 \quad 47^2 = 2209$$

$$15^2 = 225 \quad 48^2 = 2304$$

$$16^2 = 256 \quad 49^2 = 2401$$

$$17^2 = 289 \quad 50^2 = 2500$$

$$18^2 = 324 \quad 51^2 = 2601$$

$$19^2 = 361 \quad 52^2 = 2704$$

$$20^2 = 400 \quad 53^2 = 2809$$

$$21^2 = 441 \quad 54^2 = 2916$$

$$22^2 = 484 \quad 55^2 = 3025$$

$$23^2 = 529 \quad 56^2 = 3136$$

$$24^2 = 576 \quad 57^2 = 3249$$

$$25^2 = 625 \quad 58^2 = 3364$$

$$26^2 = 676 \quad 59^2 = 3481$$

$$27^2 = 729 \quad 60^2 = 3600$$

$$28^2 = 784 \quad 61^2 = 3721$$

$$29^2 = 841 \quad 62^2 = 3844$$

$$30^2 = 900 \quad 63^2 = 3969$$

$$31^2 = 961 \quad 64^2 = 4096$$

$$32^2 = 1024 \quad 65^2 = 4225$$

$$33^2 = 1089 \quad 66^2 = 4356$$

$$34^2 = 1156$$

$$35^2 = 1225$$

$$36^2 = 1296$$

$$37^2 = 1369$$

$$38^2 = 1444$$

$$39^2 = 1521$$

$$40^2 = 1600$$

$$41^2 = 1681$$

$$42^2 = 1764$$

$$43^2 = 1849$$

Dneigdliw.

-1-

cmndc = procedural date w/ common
cmmc = pointer to next node

$$D_{42} = \{1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 42\} = 2^3 \cdot 3^2$$

$$D_{180} = \{1, 2, 3, 4, 5, 6, 9, 10, 12, 15, 18, 20, 30, 36, 45, 60, 90, 180\}$$

$$D_{18} = \{1, 2, 3, 6, 9, 18\} = 2 \cdot 3^2$$

$$D_{20} = \{1, 2, 3, 4, 5, 10, 20\} = 2^2 \cdot 5$$

$$D_{62} = \{1, 2, 3, 6\} = 2^2 \cdot 3, D_4 = \{1, 2, 4\} = 2^2$$

$$D_8 = \{1, 2, 4, 8\} = 2^4 = 2^2 \cdot 2^2; D_9 = \{1, 3, 9\} = 3^2$$

$$D_{12} = \{1, 2, 3, 4, 6, 12\} = 2^2 \cdot 3$$

$$D_{42} = \{1, 2, 3, 6, 7, 12, 21, 42\}$$

$$D_{16} = \{1, 2, 4, 8, 16\} = 2^4$$

$$D_{24} = \{1, 3, 4, 6, 12\} = 3 \cdot 4$$

$$D_{22} = \{1, 2, 11, 22\} = 2 \cdot 11$$

$$D_{44} = \{1, 4, 11, 44\}$$

$$D_{91} = \{1, 7, 13, 91\}$$

$$D_{32} = \{1, 2, 4, 8, 16, 32\} = 2^5$$

$$D_{33} = \{1, 3, 11, 33\} = 3 \cdot 11$$

$$D_{34} = \{1, 2, 4, 34\} = 2 \cdot 17$$

$$D_{35} = \{1, 5, 8, 35\} = 5 \cdot 7$$

$$D_{36} = \{1, 2, 3, 4, 6, 9, 12, 18, 36\} = 2^2 \cdot 3^2$$

$$D_{37} = \{1, 3, 7\}$$

$$D_{38} = \{1, 2, 19, 38\} = 2 \cdot 19$$

$$D_{39} = \{1, 3, 13, 39\} = 3 \cdot 13$$

$$D_{40} = \{1, 2, 4, 5, 8, 10, 20, 40\} = 2^5$$

$$D_{41} = \{1, 4, 11\}$$

$$D_{42} = \{1, 2, 3, 6, 7, 11, 21, 42\} = 2^3 \cdot 7$$

$$D_{43} = \{1, 4, 34\}$$

$$25 = D_{10} = \{1, 2, 5, 10\}$$

$$D_{11} = \{1, 11\}$$

$$2 \cdot 7 = D_{15} = \{1, 2, 7, 15\}$$

$$3 \cdot 5 = D_{15} = \{1, 3, 5, 15\}$$

$$\cancel{3 \cdot 3 \cdot 2 \cdot 2} = \{1, 2, 3, 4, 6, 8, 12, 24\}$$

$$5^2 = D_{25} = \{1, 5, 25\}$$

$$2 \cdot 13 = D_{26} = \{1, 2, 13, 26\}$$

$$3^3 = D_{27} = \{1, 3, 9, 27\}$$

$$2^2 \cdot 7 = D_{28} = \{1, 2, 4, 7, 14, 28\}$$

$$D_{29} = \{1, 29\}$$

$$2 \cdot 3 \cdot 5 = D_{30} = \{1, 2, 3, 5, 6, 10, 15, 30\}$$

$$D_{31} = \{1, 31\}$$

$$D_{47} = \{1, 2, 4, 11, 22, 44\} = 2^2 \cdot 11$$

$$D_{48} = \{1, 3, 5, 9, 15, 45\} = 3^2 \cdot 5$$

$$D_{49} = \{1, 2, 3, 6, 12, 24, 48\} = 2^4 \cdot 3$$

$$D_{47} = \{1, 3, 7\}$$

$$D_{48} = \{1, 2, 3, 6, 8, 12, 16, 24, 48\} = 2^7 \cdot 3$$

$$D_{49} = \{1, 3, 9\} = 3^2$$

$$D_{50} = \{1, 2, 5, 10, 25, 50\} = 2 \cdot 5^2$$

$$D_{51} = \{1, 3, 14, 51\} = 3 \cdot 17$$

$$D_{52} = \{1, 2, 3, 13, 26, 52\} = 2^2 \cdot 13$$

$$D_{53} = \{1, 53\}$$

$$D_{54} = \{1, 2, 3, 6, 9, 18, 27, 54\} = 2 \cdot 3^3$$

$$D_{55} = \{1, 5, 11, 55\} = 5 \cdot 11$$

$$D_{56} = \{1, 2, 3, 4, 8, 13, 28, 56\} = 2^3 \cdot 7$$

- $D_{57} = \{1, 3, 19, 57\} = 3 \cdot 19$
 $D_{58} = \{1, 2, 29, 58\} = 2 \cdot 29$
 $D_{59} = \{1, 59\}$
 $D_{60} = \{1, 2, 3, 5, 6, 10, 12, 15, 20, 30, 60\} = 2 \cdot 3 \cdot 5$
 $D_{61} = \{1, 61\}$
 $D_{62} = \{1, 2, 3, 6, 62\} = 2 \cdot 31$
 $D_{63} = \{1, 3, 9, 27, 63\} = 3^2 \cdot 7$
 $D_{64} = \{1, 2, 3, 8, 16, 32, 64\} = 2^6$
 $D_{65} = \{1, 5, 13, 65\} = 5 \cdot 13$
 $D_{66} = \{1, 2, 3, 6, 11, 22, 33, 66\} = 2 \cdot 3 \cdot 11$
 $D_{67} = \{1, 67\}$
 $D_{68} = \{1, 2, 3, 14, 34, 68\} = 2 \cdot 17$
 $D_{69} = \{1, 3, 23, 69\} = 3 \cdot 23$
 $D_{70} = \{1, 2, 5, 10, 14, 35, 70\} = 2 \cdot 5 \cdot 7$
 $D_{71} = \{1, 71\}$
 $D_{72} = \{1, 2, 3, 6, 8, 9, 12, 18, 24, 36, 72\} = 2^{3,3} \cdot 2$
 $D_{73} = \{1, 73\}$
 $D_{74} = \{1, 2, 3, 74\} = 2 \cdot 37$
 $D_{75} = \{1, 3, 5, 15, 25, 75\} = 3 \cdot 5^2$
 $D_{76} = \{1, 2, 3, 19, 38, 76\} = 2 \cdot 19$
 $D_{77} = \{1, 7, 11, 77\} = 7 \cdot 11$
 $D_{78} = \{1, 2, 3, 6, 13, 26, 39, 78\} = 2 \cdot 3 \cdot 13$
 $D_{79} = \{1, 79\}$
 $D_{80} = \{1, 2, 3, 5, 8, 10, 16, 20, 40, 80\} = 2^4 \cdot 5$
 $D_{81} = \{1, 3, 9, 27, 81\} = 3^4$
 $D_{82} = \{1, 2, 3, 82\} = 2 \cdot 41$
 $D_{83} = \{1, 83\}$
 $D_{84} = \{1, 2, 3, 6, 12, 13, 24, 28, 42, 84\} = 2^2 \cdot 3 \cdot 7$
 $D_{85} = \{1, 5, 17, 85\} = 5 \cdot 17$
 $D_{86} = \{1, 2, 3, 86\} = 2 \cdot 43$
 $D_{87} = \{1, 3, 29, 87\} = 3 \cdot 29$
 $D_{88} = \{1, 2, 11, 22, 44, 88\} = 2^3 \cdot 11$
- $D_{89} = \{1, 89\}$
 $D_{90} = \{1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90\} = 2 \cdot 3^2 \cdot 5$
 $D_{91} = \{1, 13, 91\} = 7 \cdot 13$
 $D_{92} = \{1, 2, 3, 6, 9, 12, 15, 20, 30, 60\} = 2 \cdot 23$
 $D_{93} = \{1, 3, 31, 93\} = 3 \cdot 31$
 $D_{94} = \{1, 2, 3, 7, 9, 14\} = 2 \cdot 7$
 $D_{95} = \{1, 5, 18, 95\} = 5 \cdot 19 = 2^5 \cdot 3$
 $D_{96} = \{1, 2, 3, 6, 8, 12, 16, 24, 32, 48, 96\}$
 $D_{97} = \{1, 97\}$
 $D_{98} = \{1, 2, 7, 13, 49, 98\} = 2 \cdot 7^2$
 $D_{99} = \{1, 3, 9, 11, 33, 99\} = 3^2 \cdot 11$
 $D_{100} = \{1, 2, 4, 5, 10, 20, 25, 50, 100\} = 2 \cdot 5^2$
 $D_{101} = \{1, 101\}$
 $D_{102} = \{1, 2, 3, 6, 14, 34, 57, 102\} = 2 \cdot 3 \cdot 17$
 $D_{103} = \{1, 103\}$
 $D_{104} = \{1, 2, 5, 8, 13, 26, 52, 104\} = 2^3 \cdot 13$
 $D_{105} = \{1, 3, 5, 15, 21, 35, 105\} = 3 \cdot 5 \cdot 7$
 $D_{106} = \{1, 2, 5, 106\} = 2 \cdot 53$
 $D_{107} = \{1, 107\}$
 $D_{108} = \{1, 2, 3, 6, 9, 12, 18, 27, 36, 54, 108\} = 2 \cdot 3^3$
 $D_{109} = \{1, 109\}$
 $D_{110} = \{1, 2, 5, 10, 11, 22, 55, 110\} = 2 \cdot 5 \cdot 11$
 $D_{111} = \{1, 3, 3, 111\} = 3 \cdot 37$
 $D_{112} = \{1, 2, 3, 7, 8, 13, 16, 28, 56, 112\} = 2 \cdot 7$
 $D_{113} = \{1, 113\}$
 $D_{114} = \{1, 2, 3, 6, 19, 38, 57, 114\} = 2 \cdot 3 \cdot 19$
 $D_{115} = \{1, 5, 12, 105\} = 5 \cdot 23$
 $D_{116} = \{1, 2, 3, 29, 58, 116\} = 2 \cdot 29$
 $D_{117} = \{1, 3, 9, 13, 39, 117\} = 3^2 \cdot 13$
 $D_{118} = \{1, 2, 5, 118\} = 2 \cdot 59$
 $D_{119} = \{1, 119\} = 7 \cdot 17$
 $D_{120} = \{1, 2, 3, 5, 6, 8, 10, 12, 15, 20, 24, 30, 60, 120\} = 2^3 \cdot 3 \cdot 5$
 $D_{121} = \{1, 11, 121\} = 11^2$
 $D_{122} = \{1, 2, 6, 17, 22\} = 2 \cdot 61$
 $D_{123} = \{1, 3, 11, 17, 23\} = 3 \cdot 41$

$$D_{124} = \{1, 2, 3, 31, 62, 124\} = 2^2 \cdot 31$$

-2-

$$D_{125} = \{1, 5, 25, 125\} = 5^3$$

$$D_{126} = \{1, 2, 3, 6, 7, 9, 14, 18, 21, 42, 63, 126\} = 2 \cdot 3^2 \cdot 7$$

$$D_{127} = \{1, 127\}$$

$$D_{128} = \{1, 2, 4, 8, 16, 32, 64, 128\} = 2^7$$

$$D_{129} = \{1, 3, 9, 27, 81, 243, 729\} = 3 \cdot 3^5$$

$$D_{130} = \{1, 5, 10, 13, 26, 65, 130\} = 2 \cdot 5 \cdot 13$$

$$D_{131} = \{1, 131\}$$

$$D_{132} = \{1, 2, 3, 4, 6, 12, 24, 33, 66, 132\} = 2^2 \cdot 3 \cdot 11$$

$$D_{133} = \{1, 3, 13, 39\} = 7 \cdot 19$$

$$D_{134} = \{1, 2, 6, 13\} = 2 \cdot 6 \neq$$

$$D_{135} = \{1, 3, 5, 9, 15, 24, 45, 135\} = 3^3 \cdot 5$$

$$D_{136} = \{1, 2, 4, 8, 16, 32, 64, 128, 136\} = 2^3 \cdot 17$$

$$D_{137} = \{1, 137\} \neq$$

$$D_{138} = \{1, 2, 3, 6, 23, 46, 69, 138\} = 2 \cdot 3 \cdot 23$$

$$D_{139} = \{1, 139\}$$

$$D_{140} = \{1, 2, 4, 5, 10, 20, 28, 35, 70, 140\} = 2 \cdot 5 \cdot 7$$

$$D_{141} = \{1, 3, 9, 27, 81\} = 3 \cdot 7^2$$

$$D_{142} = \{1, 2, 4, 8, 16\} = 2 \cdot 4^2$$

$$D_{143} = \{1, 11, 13, 143\} = 11 \cdot 13$$

$$D_{144} = \{1, 2, 3, 6, 8, 9, 12, 16, 18, 24, 36, 48, 72, 144\} = 2^4 \cdot 3^2$$

$$D_{145} = \{1, 5, 25, 125\} = 5 \cdot 29$$

$$D_{146} = \{1, 2, 3, 6, 12, 146\} = 2 \cdot 73$$

$$D_{147} = \{1, 3, 9, 21, 27, 81, 147\} = 3 \cdot 7^2$$

$$D_{148} = \{1, 2, 3, 6, 12, 18, 24, 48, 148\} = 2^2 \cdot 3 \cdot 7$$

$$D_{149} = \{1, 149\}$$

$$D_{150} = \{1, 2, 3, 5, 10, 15, 25, 30, 50, 75, 150\} = 2 \cdot 3 \cdot 5^2$$

$$D_{151} = \{1, 151\}$$

$$D_{152} = \{1, 2, 4, 8, 16, 32, 64, 128, 152\} = 2^3 \cdot 19$$

$$D_{153} = \{1, 3, 9, 27, 51, 153\} = 3^2 \cdot 17$$

$$D_{154} = \{1, 2, 4, 8, 16, 22, 44, 88\} = 2 \cdot 7 \cdot 11$$

$$D_{155} = \{1, 5, 10, 15\} = 5 \cdot 31$$

$$D_{156} = \{1, 2, 3, 6, 12, 13, 26, 32, 52, 78, 156\} = 2^2 \cdot 3 \cdot 13$$

$$D_{157} = \{1, 157\}$$

$$D_{158} = \{1, 2, 4, 7, 9, 158\} = 2 \cdot 79$$

$$D_{159} = \{1, 3, 13, 53, 159\} = 3 \cdot 53$$

$$D_{160} = \{1, 2, 3, 5, 10, 19, 1620, 33, 50\}$$

$$D_{161} = \{1, 4, 8, 16, 32, 64, 128, 161\} = 2^5 \cdot 5$$

$$D_{162} = \{1, 2, 3, 6, 9, 18, 27, 81, 162\} = 7 \cdot 23$$

$$D_{163} = \{1, 163\} = 2 \cdot 3^4$$

$$D_{164} = \{1, 2, 4, 8, 16, 32, 64, 128, 164\} = 2^2 \cdot 51$$

$$D_{165} = \{1, 3, 5, 11, 15, 33, 55, 165\}$$

$$D_{166} = \{1, 2, 83, 166\} = 2 \cdot 83 = 3 \cdot 5 \cdot 11$$

$$D_{167} = \{1, 167\}$$

$$D_{168} = \{1, 2, 3, 6, 7, 8, 12, 13, 21, 23\}$$

$$D_{169} = \{1, 2, 3, 6, 12, 13, 24, 48, 168\} = 2^3 \cdot 3 \cdot 7$$

$$D_{170} = \{1, 2, 5, 10, 18, 34, 85, 170\} = 2 \cdot 5 \cdot 17$$

$$D_{171} = \{1, 3, 9, 19, 54, 171\} = 3^2 \cdot 19$$

$$D_{172} = \{1, 2, 4, 8, 16, 32, 64, 128, 172\} = 2^2 \cdot 43$$

$$D_{173} = \{1, 173\}$$

$$D_{174} = \{1, 2, 3, 6, 12, 24, 58, 84, 174\} = 2 \cdot 3 \cdot 2^9$$

$$D_{175} = \{1, 5, 10, 25, 30, 175\} = 5^2 \cdot 7$$

$$D_{176} = \{1, 2, 4, 8, 16, 32, 64, 128, 176\} = 2^4 \cdot 11$$

$$D_{177} = \{1, 3, 5, 9, 177\} = 3 \cdot 59$$

$$D_{178} = \{1, 2, 4, 8, 16, 32, 64, 178\} = 2 \cdot 89$$

$$D_{179} = \{1, 179\}$$

$$D_{180} = \{1, 2, 3, 5, 6, 9, 10, 12, 15, 18\} = 2^3 \cdot 3 \cdot 5$$

$$D_{181} = \{1, 2, 3, 5, 6, 10, 20, 30, 60, 90, 180\}$$

$$D_{182} = \{1, 2, 3, 6, 12, 24, 91, 182\} = 2 \cdot 7$$

$$D_{183} = \{1, 3, 6, 18, 183\} = 3 \cdot 61$$

$$D_{184} = \{1, 2, 3, 6, 8, 12, 24, 48, 92, 184\} = 2 \cdot 2^3$$

$$D_{185} = \{1, 5, 10, 15, 185\} = 5 \cdot 37$$

$$D_{186} = \{1, 2, 3, 6, 12, 24, 93, 186\} = 2 \cdot 3$$

$$D_{187} = \{1, 2, 4, 8, 16, 32, 64, 128, 187\} = 11 \cdot 17$$

$$D_{188} = \{1, 2, 4, 8, 16, 32, 64, 128, 188\} = 2 \cdot 47$$

ant 2 bătrâne mulțimi și -ultimele

$$12 \cdot 2^6 \text{ (restul divizibilă)} \rightarrow 12 \cdot 2$$

$$12 \cdot 6 = 2, \text{ rest } 6 \rightarrow 12 \cdot 6$$

Denumiri naturale

$$D_{f2} \quad f_2^2 = 6 \cdot 1 \quad 6 < f_2$$

Mulțimea de celi mici cu h. 8

$$f_2 = 2 \cdot 3 \\ f_2 = 2 \cdot 3 \\ \text{descompunere}$$

$$D_{f2} = \{1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72\}$$



$$f_2 \cdot 1 = f_2$$

$$f_2 = f_2 \cdot 1$$

$$f_2 \cdot 2 = 36$$

$$f_2 = 2 \cdot 36 \Rightarrow f_2 : 36 = 2$$

$$f_2 \cdot 3 = 24$$

$$f_2 = 3 \cdot 24 \Rightarrow f_2 : 24 = 3$$

sau

altfel

$$f_2 \cdot 18 = 18$$

$$f_2 = 1 \cdot 18 \Rightarrow f_2 : 18 = 1$$

$$f_2 \cdot 6 = 12$$

$$f_2 = 6 \cdot 12 \Rightarrow f_2 : 12 = 6$$

$$f_2 \cdot 8 = 9$$

$$f_2 = 8 \cdot 9 \Rightarrow f_2 : 9 = 8$$

$$f_2 \cdot 9 = 8$$

$$D_{f2} = \{1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72\}$$

Jumătatea	
180 : 169 = 13	180 : 2
180 : 2 = 180 : 1	180 : 2 = 2
180 : 2 = 90	180 : 3 = 60
180 : 13 = 60	180 : 3 = 60
180 : 4 = 45	180 : 5 = 36

rest de divizibile cu 2

$$180 = 2 \cdot 3^2 \cdot 5 \rightarrow 3 \cdot 3 \cdot 2 = 18 \text{ divizibile cu 2}$$

$$180 = \{1, 2, 3, 4, 5, 6, 9, 10, 12, 15, 18, 20, 30, 36, 45, 60, 90, 180\}$$

180 divizibile cu 3

divizibile cu 2 → ultima cifre par

→ 5 → ultima cifre 0 sau 5

→ 4 → ultimile 2 cifre divizibile cu 4

→ 8 → ultimile 3 cifre este divizibile cu 8

→ 25 → ult. cifre este divizibile cu 25 → 00, 25, 50, 75 → ultimile cifre

→ 125 → ultimile 3 cifre este divizibile cu 125

→ 3 → ultimele 3 cifre sunt divizibile cu 3

→ 9 → ultimele 3 cifre sunt divizibile cu 9

→ 6 → ultimele 3 cifre sunt divizibile cu 6

→ 15 → ultimele 3 cifre sunt divizibile cu 15

321 : 8

restul este cu 2

$$2 \times 2 = 4$$

$$32 - 4 = 28 \Rightarrow 28 : 8 = 3$$

$$32 : 8$$

→ cu 11 → dacă doar cifrele
sau cifrele sunt pare
sau paritatea cifrelor este par
loc paritatea cifrelor este
par → ultimele cifre

Dihydrat -debt over 2 dextran \rightarrow pyruvat

$$18 = 2^1 \cdot 3^2 \rightarrow \text{mb. } 2 \cdot 3 = \underline{\underline{6}} \quad D_{18} = \{1, 2, 3, 6, 9, 18\}$$

$$\begin{array}{c|c} 18 & 2 \\ \hline 9 & 3 \\ 3 & 3 \\ \hline (1) & \end{array} \qquad \begin{array}{c|c} 53 & 2 \\ \hline 27 & 3 \\ 9 & 3 \\ 3 & 3 \\ \hline (1) & \end{array}$$

$$53 = 2 \cdot 3^3 \rightarrow \text{nr. } 2 \cdot 3^2 \text{ doppel}$$

DG = 54236,9, 18, ~~27~~ 037

$$\Delta_{251} = 94251Y \quad i=4, 9, 12, 15, 18, 21, 28, 36, 42, 63, 84, 126, 252Y = 2^3 \cdot 3^2 \cdot 7$$

$$D_{252} = 712326891111022$$

$$D_{253} = \frac{1}{2} \ln \frac{1 + \sqrt{1 + 4 \cdot 253}}{2} = 2.124$$

$$D_{255} = \frac{1}{2} \ln \frac{1 + \sqrt{1 + 4 \cdot 255}}{2} = 2.517$$

$\Delta_{257} = 512587$

D₂₀₅ 251, 305, 15, 14, 51, 85) 200, 205, 208
1, 2, 16, 22, 67, 128, 206, 228

$$D_{256} \times \{4, 2, 7, 8, 16, 32, 64, 128\} = 2 \cdot 3 \cdot 43$$

$$D_{268} = \{42, 36, 55, 80, 115, 200\}$$

$$61, 43, 259, 7 = 37$$

$$D_{260} = \{42, 5, 10, 13, 20, 26, 54, 60, 100, 200\}$$

$$2 = 13$$

$$D_{261} = \{639, 2387, 261\} = 3 \cdot 29$$

D₂₆₅ = 545, 53, 265] = 55.53; D₂₆₆ = 442, 413, 19, 38, 133, 268] = 22.67
D₂₆₇ = 545, 53, 265] = 55.53; D₂₆₈ = 442, 413, 19, 38, 133, 268] = 22.67

D₂₆₇= 413, 89, 267, ~~4~~³, 89; D₂₆₈= 414, 217, 65, 155, 256, $\gamma = 2.3:5$

$$D_{271} = 54271 \gamma; D_{272} = 54271, 8716, 157, 3770071003 \gamma$$

$$D_{243} = \{1, 3, 4, 13, 21, 39, 94, 273\} = 34 \cdot 13; D_{244} = \{1, 2, 3, 6, 12, 23, 46, 69, 92, 188, 276\}$$

$$D_{235} = \{ h_5, 1, 125, 55, 248 \} \cup \{ 11, 248 \} \quad ; \quad D_{239} = \{ h_3, 9, 3, 193, 279 \} \cup \{ 3 \}$$

D27727h284, D28-111, D2825h255h8, 10h20, 28, 35, 40, 56, 70, 130, 280 y=2.0
D2825h255h8, 10h20, 28, 35, 40, 56, 70, 130, 280 y=2.0

D₂₈₅ = 51.25 h₁, h₂, 287) = 2.71; D₂₈₅ = 51.25 h₁, h₂, 287) = 2.71

D₂₈₈ = 5, 12, 3, 11, 6, 18, 9, 12, 16, 18, 21, 32, 36, 48, 72, 96, 112, 208, 224.

$$D_{288} = \{1, 2, 3, 7, 14, 28, 56, 112, 224\}, D_{289} = \{1, 2, 3, 7, 14, 28, 42, 84, 168, 289\}$$

$$D_{289} = \{11, 17, 28, 5, 24\}, D_{290} = \{11, 17, 28, 5, 24\},$$

$$D_{291} = \{13, 9, 17, 21\}, D_{292} = \{11, 24, 17, 19, 2, 21\}$$

$$D_{295} = \{1, 5, 59, 295\} = 5.59; D_{296} = \{1, 2, 8, 38, 74, 148, 296\} = 2^3 \cdot 37.$$

$$D_{297} = \{1, 3, 9, 11, 27, 33, 99, 287\} = 3^3 \cdot 11; D_{298} = \{1, 2, 159, 298\} = 2, 159$$

$$D_{299} = \{1, 13, 23, 299\} = 13 \cdot 23; D_{300} = \{1, 2, 3, 5, 6, 10, 12, 15, 20, 25, 30, 50, 60, 70, 100, 150, 300\} = 2^2 \cdot 3 \cdot 5^2$$

$$D_{301} = \{1, 2, 3, 301\} = 7 \cdot 43; D_{302} = \{1, 2, 151, 302\} = 2 \cdot 151; D_{303} = \{1, 3, 101, 303\} = 3 \cdot 101$$

$$D_{304} = \{1, 2, 3, 8, 16, 19, 38, 76, 152, 304\} = 2^5 \cdot 19; D_{305} = \{1, 5, 61, 305\} = 5 \cdot 61; D_{306} = \{1, 2, 3, 6, 9, 11, 18, 36, 51, 102, 153, 306\} = 2^2 \cdot 3^2 \cdot 17; D_{307} = \{1, 3, 103, 307\} = 3 \cdot 103$$

$$D_{308} = \{1, 2, 3, 6, 9, 11, 14, 22, 28, 44, 74, 154, 308\} = 2^2 \cdot 7 \cdot 11; D_{309} = \{1, 3, 103, 309\} = 3 \cdot 103$$

$$D_{310} = \{1, 2, 5, 10, 31, 64, 185, 310\} = 2 \cdot 5 \cdot 31; D_{311} = \{1, 311\}; D_{312} = \{1, 2, 3, 6, 8, 12, 13, 24, 26, 39, 52, 78, 104, 106, 312\} = 2^3 \cdot 3 \cdot 13$$

$$D_{313} = \{1, 313\}; D_{314} = \{1, 2, 15, 314\} = 2 \cdot 15; D_{315} = \{1, 3, 5, 9, 15, 21, 35, 45, 63, 105, 315\} = 3 \cdot 5 \cdot 7$$

$$D_{316} = \{1, 2, 15, 316\} = 2 \cdot 15; D_{317} = \{1, 317\}; D_{318} = \{1, 2, 3, 6, 53, 106, 159, 318\} = 2 \cdot 3 \cdot 5$$

$$D_{319} = \{1, 11, 29, 319\} = 11 \cdot 29; D_{320} = \{1, 2, 5, 8, 10, 16, 20, 32, 50, 64, 80, 160, 320\} = 2 \cdot 5$$

$$D_{321} = \{1, 3, 10, 321\} = 3 \cdot 10; D_{322} = \{1, 2, 4, 14, 23, 46, 161, 322\} = 2 \cdot 108, 162, 322$$

$$D_{323} = \{1, 2, 3, 19, 323\} = 19; D_{324} = \{1, 2, 3, 6, 9, 12, 18, 24, 36, 54, 81, 108, 162, 324\} = 2 \cdot 3^5$$

$$D_{325} = \{1, 5, 13, 25, 65, 325\} = 5 \cdot 13; D_{326} = \{1, 2, 163, 326\} = 2 \cdot 163; D_{327} = \{1, 3, 109, 327\} = 3 \cdot 109$$

$$D_{328} = \{1, 2, 8, 11, 82, 164, 328\} = 2 \cdot 41; D_{329} = \{1, 4, 329\} = 7 \cdot 47$$

$$D_{330} = \{1, 2, 3, 5, 6, 10, 11, 15, 22, 30, 33, 55, 66, 110, 165, 330\} = 2 \cdot 35 \cdot 11; D_{331} = \{1, 331\}$$

$$D_{332} = \{1, 2, 3, 5, 6, 10, 11, 15, 22, 30, 33, 55, 66, 110, 165, 332\} = 2 \cdot 83; D_{333} = \{1, 3, 9, 33, 111, 333\} = 3^2 \cdot 37; D_{334} = \{1, 2, 16, 334\} = 2 \cdot 164$$

$$D_{335} = \{1, 5, 6, 335\} = 5 \cdot 6; D_{336} = \{1, 2, 3, 6, 8, 12, 14, 16, 21, 24, 28, 42, 48, 56, 84, 112, 336\} = 2 \cdot 3 \cdot 7$$

$$D_{337} = \{1, 337\}; D_{338} = \{1, 2, 13, 26, 169, 338\} = 2 \cdot 13^2; D_{339} = \{1, 3, 113, 339\} = 3 \cdot 113$$

$$D_{340} = \{1, 2, 4, 5, 10, 14, 20, 34, 68, 85, 170, 340\} = 2 \cdot 5 \cdot 14; D_{341} = \{1, 11, 31, 341\} = 11 \cdot 31$$

$$D_{342} = \{1, 2, 3, 6, 9, 18, 19, 38, 57, 114, 141, 342\} = 2 \cdot 3^2 \cdot 19; D_{343} = \{1, 7, 9, 343\} = 7^3$$

$$D_{344} = \{1, 2, 4, 8, 13, 86, 172, 344\} = 2^3 \cdot 43; D_{345} = \{1, 35, 15, 23, 69, 115, 345\} = 3 \cdot 5 \cdot 23$$

$$D_{346} = \{1, 2, 4, 8, 13, 86, 172, 346\} = 2 \cdot 173; D_{347} = \{1, 347\}; D_{348} = \{1, 2, 3, 6, 12, 29, 58, 87, 116, 348\} = 2^2 \cdot 3 \cdot 29$$

$$D_{349} = \{1, 349\}; D_{350} = \{1, 2, 5, 10, 14, 25, 35, 50, 70, 175, 350\} = 2 \cdot 5 \cdot 7$$

$$D_{351} = \{1, 3, 9, 13, 27, 39, 117, 351\} = 3 \cdot 13; D_{352} = \{1, 2, 3, 8, 11, 16, 22, 32, 44, 88, 176, 352\} = 2^5 \cdot 11$$

$$D_{353} = \{1, 353\}; D_{354} = \{1, 2, 3, 6, 59, 118, 174, 354\} = 2 \cdot 3 \cdot 59; D_{355} = \{1, 5, 71, 355\} = 25 \cdot 7$$

$$D_{356} = \{1, 2, 3, 6, 59, 118, 174, 356\} = 2 \cdot 89; D_{357} = \{1, 3, 7, 14, 21, 51, 119, 357\} = 3 \cdot 7 \cdot 17$$

$$D_{358} = \{1, 2, 3, 6, 89, 178, 358\} = 2 \cdot 179; D_{359} = \{1, 359\}; D_{360} = \{1, 2, 3, 5, 6, 8, 9, 10, 12, 15, 20, 24, 30, 36, 40, 45, 60, 72, 90, 120, 360\}$$

$$D_{361} = \{1, 19, 361\} = 19^2; D_{362} = \{1, 2, 181, 362\} = 2 \cdot 181; D_{363} = \{1, 3, 11, 33, 121, 363\} = 3 \cdot 11$$

$$D_{364} = \{1, 2, 4, 7, 13, 14, 26, 28, 52, 91, 182, 364\} = 2^2 \cdot 7 \cdot 13; D_{365} = \{1, 5, 73, 365\} = 5 \cdot 7$$

$$D_{366} = \{1, 2, 3, 6, 61, 122, 183, 366\} = 2 \cdot 3 \cdot 61; D_{367} = \{1, 367\}$$

- $D_{368} = \{1, 2, 4, 8, 16, 23, 46, 92, 184, 368\} = 2^4 \cdot 23; D_{369} = \{1, 3, 9, 27, 123, 369\} = 3^2 \cdot 31$
 $D_{370} = \{1, 2, 5, 10, 35, 70, 185, 370\} = 2 \cdot 5 \cdot 35; D_{371} = \{1, 7, 53, 371\} = 7 \cdot 53;$
 $D_{372} = \{1, 2, 3, 6, 12, 31, 62, 93, 123, 186, 372\} = 2^2 \cdot 3 \cdot 31; D_{373} = \{1, 373\}$
 $D_{374} = \{1, 2, 11, 14, 22, 34, 184, 374\} = 2 \cdot 11 \cdot 17; D_{375} = \{1, 3, 5, 15, 25, 75, 125, 375\} = 3 \cdot 5^3$
 $D_{376} = \{1, 2, 4, 8, 16, 32, 96, 188, 376\} = 2^3 \cdot 47; D_{377} = \{1, 13, 29, 377\} = 13 \cdot 29$
 $D_{378} = \{1, 2, 3, 6, 12, 31, 62, 54, 126, 189, 378\} = 2 \cdot 3^3 \cdot 7; D_{379} = \{1, 379\}$
 $D_{380} = \{1, 2, 4, 5, 10, 19, 20, 38, 76, 95, 190, 380\} = 2^2 \cdot 5 \cdot 19; D_{381} = \{1, 3, 12, 381\} = 3 \cdot 127$
 $D_{382} = \{1, 2, 191, 382\} = 2 \cdot 191; D_{383} = \{1, 383\}; D_{384} = \{1, 2, 3, 6, 8, 12, 16, 25, 32, 48, 64, 96, 128, 192, 384\} = 2^7 \cdot 3$
 $D_{385} = \{1, 5, 11, 35, 55, 77, 385\} = 5 \cdot 7 \cdot 11; D_{386} = \{1, 2, 193, 386\} = 2 \cdot 193;$
 $D_{387} = \{1, 3, 9, 27, 123, 387\} = 3^2 \cdot 43; D_{388} = \{1, 2, 3, 9, 19, 388\} = 2^2 \cdot 97; D_{389} = \{1, 389\}$
 $D_{390} = \{1, 2, 3, 5, 6, 10, 13, 15, 26, 30, 39, 65, 78, 130, 195, 390\} = 2 \cdot 3 \cdot 5 \cdot 13; D_{391} = \{1, 13, 23, 391\} = 17 \cdot 23.$
 $D_{392} = \{1, 2, 4, 8, 16, 28, 49, 56, 98, 196, 392\} = 2^3 \cdot 7^2; D_{393} = \{1, 3, 13, 393\} = 3 \cdot 131;$
 $D_{394} = \{1, 2, 19, 394\} = 2 \cdot 197; D_{395} = \{1, 5, 79, 395\} = 5 \cdot 79.$
 $D_{396} = \{1, 2, 3, 6, 9, 11, 12, 18, 22, 33, 36, 45, 66, 99, 132, 198, 396\} = 2^2 \cdot 3^2 \cdot 11; D_{397} = \{1, 397\}$
 $D_{398} = \{1, 2, 199, 398\} = 2 \cdot 199; D_{399} = \{1, 3, 7, 19, 21, 57, 133, 399\} = 3 \cdot 7 \cdot 19$
 $D_{400} = \{1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 200, 400\} = 2^4 \cdot 5^2 \cdot 101; D_{401} = \{1, 401\}$
 $D_{402} = \{1, 2, 3, 6, 6, 13, 20, 402\} = 2 \cdot 3 \cdot 6 \cdot 7; D_{403} = \{1, 3, 31, 403\} = 13 \cdot 31.$
 $D_{404} = \{1, 2, 4, 101, 202, 404\} = 2^2 \cdot 101; D_{405} = \{1, 3, 5, 9, 15, 27, 45, 81, 135, 405\} = 3^4 \cdot 5$
 $D_{406} = \{1, 2, 4, 101, 202, 406\} = 2 \cdot 7 \cdot 29; D_{407} = \{1, 11, 34, 407\} = 11 \cdot 37.$
 $D_{408} = \{1, 2, 3, 6, 12, 24, 36, 51, 68, 102, 136, 204, 408\} = 2^3 \cdot 3 \cdot 17; D_{409} = \{1, 409\}$
 $D_{410} = \{1, 2, 5, 10, 41, 82, 205, 410\} = 2 \cdot 5 \cdot 41; D_{411} = \{1, 3, 13, 411\} = 3 \cdot 137;$
 $D_{412} = \{1, 2, 4, 103, 206, 412\} = 2 \cdot 7 \cdot 29; D_{413} = \{1, 3, 59, 413\} = 4 \cdot 59;$
 $D_{414} = \{1, 2, 3, 6, 9, 18, 23, 36, 69, 138, 204, 414\} = 2 \cdot 3^2 \cdot 23; D_{415} = \{1, 5, 83, 415\} = 5 \cdot 83$
 $D_{416} = \{1, 2, 4, 8, 13, 16, 26, 32, 52, 104, 208, 416\} = 2^5 \cdot 13; D_{417} = \{1, 3, 139, 417\} = 3 \cdot 139$
 $D_{418} = \{1, 2, 11, 19, 22, 38, 209, 418\} = 2 \cdot 11 \cdot 19; D_{419} = \{1, 419\}$
 $D_{420} = \{1, 2, 3, 4, 5, 10, 12, 14, 15, 20, 24, 28, 30, 35, 420\} = 2 \cdot 3 \cdot 5 \cdot 7; D_{421} = \{1, 421\}; D_{422} = \{1, 2, 211, 422\} = 2 \cdot 211$
 $D_{423} = \{1, 3, 9, 44, 141, 423\} = 3^2 \cdot 47; D_{424} = \{1, 2, 3, 8, 53, 106, 212, 424\} = 2 \cdot 3 \cdot 53;$
 $D_{425} = \{1, 5, 14, 25, 45, 425\} = 5 \cdot 17; D_{426} = \{1, 2, 3, 6, 7, 14, 152, 213, 426\} = 2 \cdot 3 \cdot 71.$
 $D_{427} = \{1, 7, 61, 427\} = 7 \cdot 61; D_{428} = \{1, 2, 4, 10, 21, 428\} = 2^2 \cdot 107$
 $D_{429} = \{1, 3, 11, 13, 33, 39, 143, 429\} = 3 \cdot 11 \cdot 13; D_{430} = \{1, 2, 5, 10, 43, 86, 215, 430\} = 2 \cdot 5 \cdot 43$
 $D_{431} = \{1, 431\}$

- $D_{432} = \{1, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 36, 48, 54, 72, 108, 154, 216, 432\} = 2^7 \cdot 3^3$
 $D_{433} = \{1, 433\}, D_{434} = \{1, 2, 4, 15, 31, 62, 24, 434\} = 2 \cdot 4 \cdot 31; D_{435} = \{1, 3, 5, 15, 29, 87, 155, 435\} = 3 \cdot 5 \cdot 29$
 $D_{436} = \{1, 2^4, 109, 218, 436\} = 2^2 \cdot 109; D_{437} = \{1, 19, 23, 437\} = 19 \cdot 23;$
 $D_{438} = \{1, 2, 3, 6, 7, 13, 156, 219, 438\} = 2 \cdot 3 \cdot 73; D_{439} = \{1, 439\}$
 $D_{440} = \{1, 2, 5, 8, 10, 11, 20, 22, 30, 43, 55, 88, 110, 220, 440\} = 2 \cdot 5 \cdot 11$
 $D_{441} = \{1, 3, 9, 21, 49, 63, 153, 441\} = 3^2 \cdot 7^2; D_{443} = \{1, 443\}$
 $D_{442} = \{1, 2, 13, 14, 26, 34, 221, 442\} = 2 \cdot 13 \cdot 14; D_{445} = \{1, 2, 3, 6, 12, 34, 74, 111\}$
 $D_{446} = \{1, 2, 223, 446\} = 2 \cdot 223; D_{447} = \{1, 3, 159, 447\} = 3 \cdot 159$
 $D_{448} = \{1, 2, 4, 8, 15, 16, 28, 32, 56, 64, 112, 224, 448\} = 2^6 \cdot 7; D_{449} = \{1, 449\}$
 $D_{450} = \{1, 2, 3, 5, 6, 9, 10, 15, 18, 25, 30, 45, 50, 75, 90, 150, 225, 450\} = 2 \cdot 3^2 \cdot 5^2$
 $D_{451} = \{1, 11, 41, 451\} = 11 \cdot 41; D_{452} = \{1, 2, 3, 113, 226, 452\} = 2 \cdot 113;$
 $D_{453} = \{1, 3, 151, 453\} = 3 \cdot 151; D_{454} = \{1, 2, 224, 454\} = 2 \cdot 224; D_{457} = \{1, 457\}$
 $D_{455} = \{1, 5, 13, 35, 65, 91, 455\} = 5 \cdot 7 \cdot 13$
 $D_{456} = \{1, 2, 3, 6, 8, 12, 19, 24, 38, 54, 76, 114, 153, 228, 456\} = 2 \cdot 3 \cdot 19$
 $D_{458} = \{1, 2, 229, 458\} = 2 \cdot 229; D_{459} = \{1, 3, 14, 27, 51, 103, 459\} = 3 \cdot 14$
 $D_{460} = \{1, 2, 4, 5, 10, 20, 23, 46, 92, 115, 230, 460\} = 2 \cdot 5 \cdot 23; D_{461} = \{1, 461\} = 51, 463\}$
 $D_{462} = \{1, 2, 3, 6, 11, 15, 21, 22, 33, 42, 66, 77, 154, 231, 462\} = 2 \cdot 3 \cdot 7 \cdot 11; D_{463} = \{1, 463\}$
 $D_{464} = \{1, 2, 4, 8, 16, 29, 58, 116, 232, 464\} = 2 \cdot 29; D_{465} = \{1, 3, 5, 15, 31, 93, 105, 465\} = 3 \cdot 5 \cdot 31$
 $D_{466} = \{1, 2, 233, 466\} = 2 \cdot 233; D_{467} = \{1, 467\}; D_{468} = \{1, 2, 3, 4, 6, 9, 12, 13, 18, 26, 36, 39, 52, 83, 117, 156, 234, 468\} = 2 \cdot 3^2 \cdot 13$
 $D_{467} = \{1, 2, 233, 466\} = 2 \cdot 233; D_{470} = \{1, 2, 5, 10, 470, 95, 235, 470\} = 2 \cdot 5 \cdot 47$
 $D_{469} = \{1, 469\} = 7 \cdot 67; D_{472} = \{1, 2, 4, 8, 59, 118, 236, 472\} = 2 \cdot 5 \cdot 59$
 $D_{471} = \{1, 3, 15, 471\} = 3 \cdot 15; D_{473} = \{1, 2, 3, 6, 79, 108, 237, 473\} = 2 \cdot 3 \cdot 72$
 $D_{473} = \{1, 11, 43, 473\} = 11 \cdot 43; D_{476} = \{1, 2, 4, 7, 15, 17, 28, 34, 68, 119, 238, 476\} = 2 \cdot 2 \cdot 7 \cdot 17$
 $D_{477} = \{1, 5, 19, 25, 90, 477\} = 5^2 \cdot 19; D_{478} = \{1, 2, 239, 478\} = 2 \cdot 239; D_{479} = \{1, 479\}$
 $D_{477} = \{1, 3, 9, 53, 159, 477\} = 3^2 \cdot 53; D_{478} = \{1, 2, 239, 478\} = 2 \cdot 239; D_{479} = \{1, 479\}$
 $D_{480} = \{1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 16, 20, 24, 30, 32, 40, 48, 60, 80, 96, 120, 160, 240, 480\} = 2 \cdot 240$
 $D_{480} = \{1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 16, 20, 24, 30, 32, 40, 48, 60, 80, 96, 120, 160, 240, 480\} = 2 \cdot 240$
 $D_{481} = \{1, 13, 13, 481\} = 13 \cdot 37; D_{482} = \{1, 2, 241, 482\} = 2 \cdot 241$
 $D_{483} = \{1, 3, 7, 21, 23, 69, 161, 483\} = 3 \cdot 7 \cdot 23; D_{484} = \{1, 2, 3, 11, 22, 44, 121, 242, 484\} = 2^2 \cdot 11^2$
 $D_{485} = \{1, 5, 9, 485\} = 5 \cdot 97; D_{486} = \{1, 2, 3, 6, 9, 18, 27, 54, 81, 162, 243, 486\} = 2 \cdot 3^5$
 $D_{487} = \{1, 487\}; D_{488} = \{1, 2, 3, 8, 6, 12, 24, 488\} = 2^3 \cdot 61; D_{489} = \{1, 3, 163, 489\} = 3 \cdot 163$
 $D_{490} = \{1, 2, 5, 7, 10, 15, 35, 49, 70, 98, 245, 490\} = 2 \cdot 5 \cdot 7^2; D_{491} = \{1, 491\}$
 $D_{492} = \{1, 2, 3, 4, 6, 12, 41, 82, 123, 164, 246, 492\} = 2^2 \cdot 3 \cdot 51; D_{493} = \{1, 15, 29, 493\} = 2 \cdot 17 \cdot 29$
 $D_{494} = \{1, 2, 13, 19, 26, 38, 247, 494\} = 2 \cdot 13 \cdot 19; D_{495} = \{1, 3, 5, 9, 11, 15, 33, 495\} = 3 \cdot 5 \cdot 11$
 $D_{496} = \{1, 2, 8, 16, 31, 62, 124, 248, 496\} = 2 \cdot 31; D_{497} = \{1, 497\} = 7 \cdot 71.$

$D_{498} = \{1, 2, 3, 6, 83, 166, 249, 498\} = 2 \cdot 3 \cdot 83$; $A_{499} = \{1, 499\}$

$D_{621} = \{1, 3, 9, 23, 27, 69, 207, 621\}; D_{622} = \{1, 2, 31, 622\} = 2 \cdot 311; D_{623} = \{1, 3, 83, 623\} = 7 \cdot 89$
 $= 33 \cdot 23$

$D_{624} = \{1, 2, 3, 6, 8, 12, 13, 16, 24, 26, 39, 48, 52, 78, 104, 156, 208, 314, 624\} = 2^3 \cdot 3 \cdot 13$

$D_{625} = \{1, 5, 25, 125, 625\} = 5^3$; $D_{626} = \{1, 2, 313, 626\} = 2 \cdot 313$

$D_{627} = \{1, 3, 11, 19, 33, 57, 209, 627\} = 2^3 \cdot 11 \cdot 19$; $D_{628} = \{1, 2, 157, 315, 628\} = 2^2 \cdot 157$

$D_{629} = \{1, 1, 3, 7, 629\} = 17 \cdot 37$; $D_{630} = \{1, 3, 5, 6, 27, 9, 12, 14, 15, 18, 21, 30, 35, 42, 45, 63, 70, 90, 105, 126, 210, 315, 630\} = 2 \cdot 3^2 \cdot 5 \cdot 7$

$D_{631} = \{1, 1, 631\}; D_{632} = \{1, 2, 8, 49, 108, 316, 632\} = 2^3 \cdot 7 \cdot 9$; $A_{633} = \{1, 3, 21, 633\} = 3 \cdot 211$

$D_{634} = \{1, 2, 3, 17, 634\} = 2 \cdot 3 \cdot 17$; $D_{635} = \{1, 5, 12, 635\} = 5 \cdot 127$

$D_{636} = \{1, 2, 3, 6, 12, 27, 106, 159, 213, 318, 636\} = 2^2 \cdot 3 \cdot 53$; $D_{637} = \{1, 2, 13, 59, 91, 637\} = 7^2 \cdot 13$

$D_{638} = \{1, 2, 11, 22, 29, 58, 319, 638\} = 2 \cdot 11 \cdot 29$; $D_{639} = \{1, 3, 9, 7, 213, 639\} = 3^2 \cdot 7$

$D_{640} = \{1, 2, 4, 5, 8, 9, 10, 16, 20, 32, 40, 64, 80, 128, 160, 320, 640\} = 2^7 \cdot 5$; $D_{641} = \{1, 641\}$

$D_{642} = \{1, 1, 2, 3, 6, 10, 21, 34, 642\} = 2 \cdot 3 \cdot 107$; $D_{643} = \{1, 643\}$

$D_{644} = \{1, 2, 3, 7, 15, 23, 28, 46, 92, 161, 322, 644\} = 2^2 \cdot 7 \cdot 23$; $D_{645} = \{1, 3, 5, 15, 43, 129, 245, 645\} = 3 \cdot 5 \cdot 53$

$D_{646} = \{1, 2, 7, 13, 34, 38, 323, 646\} = 2 \cdot 17 \cdot 19$; $D_{647} = \{1, 647\}$

$D_{648} = \{1, 2, 3, 6, 8, 9, 12, 18, 24, 27, 36, 54, 72, 84, 108, 162, 216, 324, 648\} = 2^3 \cdot 3^5$

$D_{649} = \{1, 1, 59, 649\} = 11 \cdot 59$; $D_{650} = \{1, 2, 5, 10, 13, 25, 26, 50, 65, 130, 325, 650\}$

$D_{651} = \{1, 3, 7, 21, 31, 93, 213, 651\} = 3 \cdot 7 \cdot 31$; $D_{652} = \{1, 2, 3, 163, 326, 652\} = 2^2 \cdot 5^2 \cdot 13$

$D_{653} = \{1, 653\}; D_{654} = \{1, 2, 3, 6, 10, 24, 32, 654\} = 2 \cdot 3 \cdot 109$; $D_{655} = \{1, 5, 13, 655\} = 5 \cdot 13$

$D_{656} = \{1, 2, 4, 8, 16, 31, 82, 164, 328, 656\} = 2^5 \cdot 31$; $D_{657} = \{1, 3, 9, 7, 3, 249, 657\} = 3^2 \cdot 73$

$D_{658} = \{1, 2, 7, 15, 47, 93, 329, 658\} = 2 \cdot 7 \cdot 47$; $D_{659} = \{1, 659\}$

$D_{660} = \{1, 2, 3, 4, 5, 6, 10, 11, 12, 15, 20, 22, 30, 33, 44, 55, 60, 66, 110, 132, 165, 220, 330, 660\} = 2 \cdot 3 \cdot 5 \cdot 11$

$D_{661} = \{1, 661\}; D_{662} = \{1, 2, 33, 662\} = 2 \cdot 331$

$D_{663} = \{1, 3, 13, 21, 39, 57, 224, 663\} = 3 \cdot 13 \cdot 17$; $D_{664} = \{1, 2, 3, 8, 83, 166, 333, 664\} = 2 \cdot 3 \cdot 3^2$

$D_{665} = \{1, 5, 19, 35, 95, 133, 665\} = 5 \cdot 19$; $D_{666} = \{1, 2, 3, 6, 9, 18, 37, 74, 111, 224, 333, 666\} = 2 \cdot 3 \cdot 37$

$D_{667} = \{1, 2, 3, 29, 667\} = 23 \cdot 29$; $D_{668} = \{1, 2, 3, 167, 334, 668\} = 2^2 \cdot 167$; $D_{669} = \{1, 3, 223, 669\} = 3 \cdot 223$

$D_{660} = \{1, 2, 5, 10, 67, 134, 335, 670\} = 2 \cdot 5 \cdot 67$; $D_{671} = \{1, 11, 64, 671\} = 11 \cdot 61$

$D_{672} = \{1, 2, 3, 6, 7, 8, 12, 14, 16, 21, 24, 28, 32, 42, 48, 56, 84, 96, 112, 168, 224, 336, 672\} = 2 \cdot 3 \cdot 7$

$D_{673} = \{1, 673\}; D_{674} = \{1, 3, 9, 15, 25, 27, 45, 45, 135, 225, 674\} = 3 \cdot 5$

$D_{675} = \{1, 2, 7, 13, 26, 52, 169, 338, 675\} = 2^2 \cdot 13^2$; $D_{676} = \{1, 2, 3, 6, 113, 226, 339, 678\} = 2 \cdot 3 \cdot 113$

$D_{677} = \{1, 2, 9, 7, 677\} = 7 \cdot 97$; $D_{680} = \{1, 2, 4, 5, 8, 10, 17, 20, 34, 50, 68, 87, 136, 170, 320, 680\} = 2 \cdot 3 \cdot 5 \cdot 7$

$D_{681} = \{1, 3, 227, 681\} = 3 \cdot 227$; $D_{682} = \{1, 2, 11, 22, 31, 62, 34, 682\} = 2 \cdot 11 \cdot 31$; $D_{683} = \{1, 683\}$

$D_{684} = \{1, 2, 3, 6, 9, 12, 18, 13, 36, 38, 54, 76, 144, 228, 342, 684\} = 2^2 \cdot 3^2 \cdot 19$

$D_{685} = \{1, 2, 3, 6, 9, 12, 18, 13, 36, 38, 54, 76, 144, 228, 342, 685\} = 2 \cdot 3 \cdot 7^3$

DIVIZORII

-+

$$D_{500} = \{1, 2, 4, 5, 10, 20, 25, 50, 100, 125, 250, 500\} = 2^2 \cdot 5^3$$

$$D_{501} = \{1, 3, 16, 501\} = 3 \cdot 167 \quad D_{503} = \{1, 503\}$$

$$D_{502} = \{1, 2, 251, 502\} = 2 \cdot 251$$

$$D_{504} = \{1, 2, 3, 4, 6, 8, 9, 12, 14, 18, 21, 24, 28, 36, 42, 56, 63, 72, 84, 126, 168, 252, 504\} = 2^3 \cdot 3^2 \cdot 7$$

$$D_{506} = \{1, 2, 11, 22, 23, 46, 253, 506\} = 2 \cdot 11 \cdot 23 \quad D_{509} = \{1, 509\}$$

$$D_{508} = \{1, 2, 4, 12, 24, 254, 508\} = 2^2 \cdot 127; \quad D_{510} = \{1, 2, 3, 5, 6, 10, 15, 17, 30, 34, 51, 85, 102, 170, 255, 510\} = 2 \cdot 3 \cdot 5 \cdot 17$$

$$D_{511} = \{1, 4, 73, 511\} = 4 \cdot 73$$

$$D_{512} = \{1, 2, 4, 8, 16, 32, 64, 128, 256, 512\} = 2^9; \quad D_{513} = \{1, 3, 9, 19, 27, 54, 171, 513\} = 3^3 \cdot 19$$

$$D_{514} = \{1, 2, 25, 514\} = 2 \cdot 257; \quad D_{515} = \{1, 5, 103, 515\} = 5 \cdot 103$$

$$D_{516} = \{1, 2, 3, 4, 6, 12, 43, 86, 129, 172, 258, 516\} = 2^2 \cdot 3 \cdot 53$$

$$D_{517} = \{1, 11, 47, 517\} = 11 \cdot 47;$$

$$D_{517} = \{1, 3, 179, 517\} = 3 \cdot 179$$

$$D_{518} = \{1, 2, 4, 13, 34, 76, 259, 518\} = 2 \cdot 4 \cdot 37$$

$$D_{518} = \{1, 2, 269, 518\} = 2 \cdot 269$$

$$D_{519} = \{1, 3, 173, 519\} = 3 \cdot 173$$

$$D_{519} = \{1, 11, 49, 539\} = 7 \cdot 11$$

$$D_{520} = \{1, 2, 4, 5, 8, 10, 13, 20, 26, 50, 52, 65, 104, 130, 260, 520\} = 2^{2,5} \cdot 13$$

$$D_{520} = \{1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 18, 20, 24, 30, 36, 45, 54, 60, 90, 108, 135, 180, 270, 540\} = 2 \cdot 3^3 \cdot 5$$

$$D_{521} = \{1, 521\}$$

$$D_{521} = \{1, 521\} = 2 \cdot 271$$

$$D_{522} = \{1, 2, 3, 6, 9, 18, 29, 58, 87, 174, 261, 522\} = 2 \cdot 3^2 \cdot 29$$

$$D_{522} = \{1, 2, 271, 522\} = 2 \cdot 271$$

$$D_{523} = \{1, 523\}$$

$$D_{523} = \{1, 3, 181, 523\} = 3 \cdot 181$$

$$D_{524} = \{1, 2, 4, 13, 26, 524\} = 2^2 \cdot 131$$

$$D_{524} = \{1, 2, 13, 26, 524\} = 2^2 \cdot 131$$

$$D_{525} = \{1, 3, 5, 7, 15, 21, 25, 35, 45, 105, 175, 525\} = 3 \cdot 5^2 \cdot 7$$

$$D_{525} = \{1, 2, 4, 8, 16, 32, 64, 128, 256, 525\} = 2^2 \cdot 5^2 \cdot 5$$

$$D_{526} = \{1, 2, 263, 526\} = 2 \cdot 263$$

$$D_{526} = \{1, 2, 263, 526\} = 2 \cdot 263$$

$$D_{527} = \{1, 17, 31, 527\} = 17 \cdot 31$$

$$D_{527} = \{1, 5, 109, 527\} = 5 \cdot 109$$

$$D_{528} = \{1, 2, 3, 4, 6, 8, 11, 12, 16, 22, 24, 33, 44, 48, 66, 88, 132, 176, 264, 528\}; \quad D_{528} = \{1, 528\} = 2 \cdot 137$$

$$D_{528} = \{1, 2, 4, 13, 26, 528\} = 2 \cdot 137$$

$$D_{529} = \{1, 23, 529\} = 23^2$$

$$D_{529} = \{1, 39, 61, 183, 529\} = 3^2 \cdot 61$$

$$D_{530} = \{1, 2, 5, 10, 53, 106, 265, 530\} = 2 \cdot 5 \cdot 53$$

$$D_{530} = \{1, 2, 5, 10, 53, 106, 265, 530\} = 2 \cdot 5 \cdot 53$$

$$D_{531} = \{1, 3, 9, 59, 17, 531\} = 3^2 \cdot 59$$

$$D_{531} = \{1, 19, 29, 531\} = 19 \cdot 29$$

$$D_{532} = \{1, 2, 3, 4, 6, 8, 12, 23, 24, 46, 69, 92, 138, 184, 276, 532\} = 2^3 \cdot 3 \cdot 23$$

$$D_{532} = \{1, 2, 3, 4, 6, 8, 12, 23, 24, 46, 69, 92, 138, 184, 276, 532\} = 2^3 \cdot 3 \cdot 23$$

$$D_{533} = \{1, 13, 31, 533\} = 13 \cdot 51$$

$$D_{533} = \{1, 7, 79, 533\} = 7 \cdot 79$$

$$D_{534} = \{1, 2, 3, 6, 89, 178, 264, 534\} = 2 \cdot 2 \cdot 277$$

$$D_{534} = \{1, 3, 5, 15, 34, 111, 185, 534\} = 3 \cdot 5 \cdot 34$$

$$D_{535} = \{1, 5, 10, 535\} = 5 \cdot 107$$

$$D_{535} = \{1, 2, 3, 9, 13, 27, 535\} = 2^2 \cdot 139$$

$$D_{536} = \{1, 2, 3, 9, 13, 27, 536\} = 2^2 \cdot 67$$

$$D_{536} = \{1, 5, 15, 34, 111, 185, 536\} = 3 \cdot 5 \cdot 34$$

$$\Delta_{588} = \{1, 2, 3, 6, 9, 18, 31, 62, 93, 186, 279, 588\}$$

$$= 2 \cdot 3^2 \cdot 31$$

$$\Delta_{589} = \{1, 13, 43, 589\} = 13 \cdot 43$$

$$\Delta_{590} = \{1, 2, 4, 5, 7, 8, 10, 13, 16, 20, 28, 35, 40, \\ 56, 70, 80, 112, 150, 280, 560\} = 2 \cdot 5 \cdot 7$$

$$\Delta_{591} = \{1, 3, 11, 17, 33, 51, 187, 561\} = 3 \cdot 11 \cdot 17$$

$$\Delta_{592} = \{1, 2, 281, 562\} = 2 \cdot 281$$

$$\Delta_{593} = \{1, 563\}$$

$$\Delta_{594} = \{1, 2, 3, 6, 12, 43, 93, 156, 188, 282, 564\} \\ = 2^2 \cdot 3 \cdot 57$$

$$\Delta_{595} = \{1, 5, 113, 565\} = 5 \cdot 113$$

$$\Delta_{596} = \{1, 2, 283, 566\} = 2 \cdot 283$$

$$\Delta_{597} = \{1, 3, 7, 9, 21, 27, 63, 81, 189, 567\} \\ = 3^2 \cdot 7$$

$$\Delta_{598} = \{1, 2, 3, 8, 71, 142, 284, 568\} \\ = 2^3 \cdot 71$$

$$\Delta_{599} = \{1, 569\}; \Delta_{571} = \{1, 571\}$$

$$\Delta_{570} = \{1, 2, 3, 5, 6, 10, 15, 19, 30, 38, 57, 95\}$$

$$113, 190, 285, 570\} = 2 \cdot 3 \cdot 5 \cdot 19$$

$$\Delta_{572} = \{1, 2, 3, 11, 13, 22, 26, 43, 52, 143, \\ 286, 572\} = 2 \cdot 11 \cdot 13$$

$$\Delta_{573} = \{1, 3, 191, 573\} = 3 \cdot 191$$

$$\Delta_{574} = \{1, 2, 3, 4, 11, 82, 287, 574\} \\ = 2 \cdot 4 \cdot 51$$

$$\Delta_{575} = \{1, 5, 23, 25, 115, 575\} = 5^2 \cdot 23$$

$$\Delta_{576} = \{1, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 32, 36, \\ 48, 64, 72, 96, 144, 192, 288, 576\} = 2^{6 \cdot 3^2}$$

$$\Delta_{577} = \{1, 577\}$$

$$\Delta_{578} = \{1, 2, 3, 4, 289, 578\} = 2 \cdot 14^2$$

$$\Delta_{579} = \{1, 3, 193, 579\} = 3 \cdot 193$$

$$\Delta_{580} = \{1, 2, 3, 5, 10, 20, 29, 58, 116, 155, 290, 580\} \\ = 2^2 \cdot 5 \cdot 29$$

$$\Delta_{581} = \{1, 3, 83, 581\} = 7 \cdot 83$$

$$\Delta_{582} = \{1, 2, 3, 6, 9, 18, 19, 281, 582\} = 2 \cdot 3 \cdot 97$$

$$\Delta_{583} = \{1, 11, 53, 583\} = 11 \cdot 53$$

$$\Delta_{584} = \{1, 2, 3, 4, 7, 8, 13, 16, 29, 584\} = 2^2 \cdot 7 \cdot 3$$

$$\Delta_{585} = \{1, 3, 5, 9, 13, 15, 39, 45, 65, 113, 195, 585\} \\ = 3^2 \cdot 5 \cdot 13$$

$$\Delta_{586} = \{1, 2, 293, 586\} = 2 \cdot 293$$

$$\Delta_{587} = \{1, 587\}$$

$$\Delta_{588} = \{1, 2, 3, 5, 6, 7, 13, 17, 24, 28, 42, 49, 85\} \\ 98, 143, 196, 294, 588\} = 2^2 \cdot 3 \cdot 7^2$$

$$\Delta_{589} = \{1, 19, 31, 589\} = 19 \cdot 31$$

$$\Delta_{590} = \{1, 2, 5, 10, 59, 118, 295, 590\} = 2 \cdot 5 \cdot 59$$

$$\Delta_{591} = \{1, 3, 19, 59, 591\} = 3 \cdot 197$$

$$\Delta_{592} = \{1, 2, 3, 6, 12, 16, 37, 75, 148, 296, 592\} \\ = 2^4 \cdot 37$$

$$\Delta_{593} = \{1, 593\}; \Delta_{594} = \{1, 2, 3, 6, 9, 11, 18, 22, \\ 27, 33, 54, 66, 98, 198, 297, 594\} = 2 \cdot 3^3 \cdot 11$$

$$\Delta_{595} = \{1, 5, 7, 14, 35, 85, 119, 585\} = 5 \cdot 7 \cdot 17$$

$$\Delta_{596} = \{1, 2, 4, 7, 14, 28, 596\} = 2^2 \cdot 149$$

$$\Delta_{597} = \{1, 3, 199, 597\} = 3 \cdot 199$$

$$\Delta_{598} = \{1, 2, 13, 23, 26, 46, 299, 598\} = 2 \cdot 13 \cdot 23$$

$$\Delta_{599} = \{1, 599\}$$

$$\Delta_{600} = \{1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 26, \\ 30, 49, 50, 60, 75, 100, 120, 150, 200, 300, 600\} \\ = 2^3 \cdot 3 \cdot 5^2; \Delta_{601} = \{1, 601\}$$

$$\Delta_{602} = \{1, 2, 4, 7, 14, 43, 86, 301, 602\} = 2 \cdot 7 \cdot 53$$

$$\Delta_{603} = \{1, 3, 9, 6, 21, 603\} = 3^2 \cdot 67$$

$$\Delta_{604} = \{1, 2, 4, 15, 30, 604\} = 2^2 \cdot 151$$

$$\Delta_{605} = \{1, 5, 11, 55, 121, 605\} = 5 \cdot 11^2$$

$$\Delta_{606} = \{1, 2, 3, 6, 10, 20, 30, 303, 606\} = 2 \cdot 3 \cdot 101$$

$$\Delta_{607} = \{1, 607\}$$

$$\Delta_{608} = \{1, 2, 4, 8, 16, 19, 32, 38, 76, 152, 303, \\ 608\} = 2^5 \cdot 19$$

$$\Delta_{609} = \{1, 3, 7, 21, 29, 87, 203, 609\} = 3 \cdot 7 \cdot 29$$

$$\Delta_{610} = \{1, 2, 5, 10, 61, 122, 305, 610\} = 2 \cdot 5 \cdot 61$$

$$\Delta_{611} = \{1, 13, 44, 611\} = 13 \cdot 47; \Delta_{613} = \{1, 613\}$$

$$\Delta_{612} = \{1, 2, 3, 4, 6, 9, 12, 17, 18, 34, 36, 51, 68, \\ 102, 153, 204, 306, 612\} = 2^2 \cdot 3^2 \cdot 17$$

$$\Delta_{614} = \{1, 2, 3, 7, 614\} = 2 \cdot 3 \cdot 7$$

$$\Delta_{615} = \{1, 3, 5, 15, 44, 123, 205, 615\} = 3 \cdot 5 \cdot 51$$

$$\Delta_{616} = \{1, 2, 4, 7, 8, 11, 13, 23, 28, 44, 56, 77, 88, \\ 154, 308, 616\} = 2^3 \cdot 7 \cdot 11$$

$$\Delta_{617} = \{1, 617\} \quad \Delta_{619} = \{1, 619\}$$

$$\Delta_{618} = \{1, 2, 3, 6, 103, 206, 309, 618\} = 2 \cdot 3 \cdot 103$$

$$\Delta_{620} = \{1, 2, 4, 5, 6, 10, 20, 31, 62, 12, 155, 310, 620\} = 2^2 \cdot 5 \cdot 31$$

- $\Delta_{687} = \{1, 3, 229, 687\} = 3 \cdot 229$; $\Delta_{688} = \{1, 2, 3, 8, 16, 43, 86, 172, 344, 688\} = 2^5 \cdot 63$
 $\Delta_{689} = \{1, 13, 53, 689\} = 13 \cdot 53$; $\Delta_{690} = \{1, 2, 3, 5, 6, 10, 15, 23, 30, 56, 69, 115, 138, 230, 340, 690\} = 2 \cdot 3 \cdot 5 \cdot 23$
 $\Delta_{691} = \{1, 691\}$; $\Delta_{692} = \{1, 2, 3, 173, 346, 692\} = 2 \cdot 173$; $\Delta_{693} = \{1, 3, 8, 11, 24, 33, 63, 77, 99, 231, 693\} = 3^2 \cdot 7 \cdot 11$
 $\Delta_{694} = \{1, 2, 3, 4, 5, 6, 95\} = 2 \cdot 3 \cdot 5$; $\Delta_{695} = \{1, 17, 139, 695\} = 5 \cdot 139$
 $\Delta_{696} = \{1, 2, 3, 5, 6, 8, 12, 29, 58, 87, 116, 173, 232, 348, 696\} = 2^3 \cdot 3 \cdot 29$
 $\Delta_{697} = \{1, 17, 51, 697\} = 17 \cdot 31$; $\Delta_{698} = \{1, 2, 349, 698\} = 2 \cdot 349$; $\Delta_{699} = \{1, 3, 233, 699\}$
 $\Delta_{700} = \{1, 2, 5, 10, 14, 20, 25, 28, 35, 50, 100, 140, 170, 300, 500\} = 2 \cdot 5 \cdot 7$
 $\Delta_{701} = \{1, 7, 103\}$; $\Delta_{702} = \{1, 2, 3, 6, 9, 13, 18, 26, 29, 39, 53, 78, 117, 233, 303, 702\} = 2 \cdot 3^3 \cdot 13$
 $\Delta_{703} = \{1, 19, 37, 703\} = 19 \cdot 37$; $\Delta_{704} = \{1, 2, 5, 8, 11, 16, 22, 32, 41, 6, 88, 116, 352, 704\} = 2 \cdot 6 \cdot 11$
 $\Delta_{705} = \{1, 3, 5, 15, 41, 121, 235, 705\} = 3 \cdot 5 \cdot 41$; $\Delta_{706} = \{1, 2, 3, 533, 706\} = 2 \cdot 303$
 $\Delta_{707} = \{1, 2, 5, 10, 17, 707\} = 4 \cdot 101$; $\Delta_{708} = \{1, 2, 3, 5, 12, 59, 118, 17, 236, 303, 708\} = 2^2 \cdot 3 \cdot 59$
 $\Delta_{709} = \{1, 7, 9\}$; $\Delta_{710} = \{1, 2, 5, 10, 14, 23, 35, 710\} = 2 \cdot 5 \cdot 71$; $\Delta_{711} = \{1, 3, 9, 7, 23, 711\} = 3^2 \cdot 79$
 $\Delta_{712} = \{1, 2, 4, 8, 9, 18, 26, 712\} = 23 \cdot 89$; $\Delta_{713} = \{1, 2, 3, 31, 713\} = 23 \cdot 31$
 $\Delta_{714} = \{1, 2, 3, 6, 11, 14, 24, 34, 52, 57, 102, 119, 238, 35, 714\} = 2 \cdot 3 \cdot 7 \cdot 17$
 $\Delta_{715} = \{1, 5, 11, 13, 55, 65, 133, 715\} = 5 \cdot 11 \cdot 13$; $\Delta_{716} = \{1, 2, 5, 179, 303, 716\} = 2 \cdot 179$
 $\Delta_{717} = \{1, 3, 239, 717\} = 3 \cdot 239$; $\Delta_{718} = \{1, 2, 359, 718\} = 2 \cdot 359$; $\Delta_{719} = \{1, 7, 9\}$
 $\Delta_{720} = \{1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 16, 18, 20, 24, 30, 36, 40, 45, 48, 60, 72, 80, 90, 120, 144, 180, 240, 360, 720\} = 2^4 \cdot 3^2 \cdot 5$; $\Delta_{721} = \{1, 2, 5, 103, 721\} = 2 \cdot 103$
 $\Delta_{722} = \{1, 2, 13, 38, 361, 722\} = 2 \cdot 192$; $\Delta_{723} = \{1, 3, 241, 723\} = 3 \cdot 241$
 $\Delta_{724} = \{1, 2, 5, 18, 362, 724\} = 2^2 \cdot 181$; $\Delta_{725} = \{1, 5, 25, 29, 145, 725\} = 5^2 \cdot 29$
 $\Delta_{726} = \{1, 2, 3, 6, 11, 22, 33, 66, 124, 242, 363, 726\} = 2 \cdot 3 \cdot 11^2$; $\Delta_{727} = \{1, 7, 27\}$
 $\Delta_{728} = \{1, 2, 4, 8, 13, 14, 26, 28, 52, 56, 91, 104, 182, 363, 728\} = 2^3 \cdot 7 \cdot 13$
 $\Delta_{729} = \{1, 3, 9, 27, 81, 243, 729\} = 3^3$; $\Delta_{730} = \{1, 2, 5, 10, 13, 16, 365, 730\} = 2 \cdot 5 \cdot 43$
 $\Delta_{731} = \{1, 4, 13, 43, 731\} = 17 \cdot 43$; $\Delta_{732} = \{1, 2, 3, 4, 6, 12, 16, 12, 183, 243, 366, 732\} = 2^2 \cdot 3 \cdot 61$
 $\Delta_{733} = \{1, 7, 33\}$; $\Delta_{734} = \{1, 2, 36, 734\} = 2 \cdot 364$; $\Delta_{735} = \{1, 3, 5, 15, 24, 35, 48, 105, 125, 240, 735\} = 3 \cdot 5 \cdot 42$
 $\Delta_{736} = \{1, 2, 7, 8, 16, 23, 32, 46, 92, 18, 368, 736\} = 2^5 \cdot 23$; $\Delta_{737} = \{1, 11, 6, 7, 737\} = 11 \cdot 67$
 $\Delta_{738} = \{1, 2, 3, 6, 9, 18, 41, 82, 123, 246, 369, 738\} = 2 \cdot 3^2 \cdot 41$; $\Delta_{739} = \{1, 7, 39\}$
 $\Delta_{740} = \{1, 2, 5, 10, 20, 37, 73, 158, 185, 370, 740\} = 2 \cdot 5 \cdot 37$; $\Delta_{743} = \{1, 7, 53\}$
 $\Delta_{741} = \{1, 3, 13, 19, 39, 57, 214, 741\} = 3 \cdot 13 \cdot 19$; $\Delta_{744} = \{1, 2, 3, 6, 8, 12, 24, 31, 62, 93, 186, 248, 372, 744\} = 2^3 \cdot 3 \cdot 31$
 $\Delta_{745} = \{1, 2, 5, 11, 53, 106, 371, 745\} = 2 \cdot 7 \cdot 53$
 $\Delta_{746} = \{1, 5, 14, 49, 746\} = 25 \cdot 49$; $\Delta_{747} = \{1, 2, 3, 73, 747\} = 2 \cdot 373$
 $\Delta_{748} = \{1, 5, 14, 49, 748\} = 25 \cdot 49$; $\Delta_{749} = \{1, 2, 4, 11, 22, 34, 68, 187, 373, 749\} = 2 \cdot 3^2 \cdot 11 \cdot 17$
 $\Delta_{750} = \{1, 2, 3, 5, 6, 10, 15, 25, 30, 50, 75, 125, 180, 200, 750\}$
 $\Delta_{751} = \{1, 7, 51\}$; $\Delta_{752} = \{1, 2, 4, 8, 16, 24, 48, 93, 188, 346, 752\} = 2 \cdot 47$
 $\Delta_{753} = \{1, 3, 25, 753\} = 3 \cdot 251$; $\Delta_{754} = \{1, 2, 13, 26, 29, 58, 374, 754\} = 2 \cdot 13 \cdot 25$

- $D_{458} = \{45, 15, 70\}, D_{459} = \{5, 15\}; D_{460} = \{6, 3, 6, 4, 9, 12, 13, 18, 24, 25, 28, 36, 42, 53, 63, 87, 103, 126, 189, 202, 348, 760\} = 2^2 \cdot 3^3 \cdot 7$
 $D_{461} = \{4, 15\}, D_{462} = \{12, 37, 70\} = 2 \cdot 37; D_{463} = \{1, 109, 763\} = 7 \cdot 109$
 $D_{464} = \{1, 2, 3, 6, 12, 25, 38, 764\} = 2^2 \cdot 191; D_{465} = \{1, 3, 5, 9, 15, 18, 20, 51, 85, 153, 205, 765\} = 2^2 \cdot 5 \cdot 17$
 $D_{466} = \{1, 2, 3, 83, 766\} = 2 \cdot 383; D_{467} = \{1, 13, 59, 767\} = 13 \cdot 59$
 $D_{468} = \{1, 2, 3, 6, 12, 16, 24, 32, 48, 6, 96, 128, 192, 205, 384, 768\} = 2^8 \cdot 3$
 $D_{469} = \{1, 769\}; D_{470} = \{1, 2, 10, 11, 13, 22, 35, 55, 70, 110, 15, 385, 769\} = 2 \cdot 5 \cdot 11$
 $D_{471} = \{1, 3, 25, 771\} = 3 \cdot 25; D_{472} = \{1, 2, 193, 386, 772\} = 2^2 \cdot 193; D_{473} = \{1, 773\}$
 $D_{474} = \{1, 2, 3, 6, 9, 18, 23, 86, 123, 258, 387, 774\}; D_{475} = \{1, 5, 25, 31, 105, 775\} = 2^2 \cdot 31$
 $= 2 \cdot 3^2 \cdot 13$
 $D_{476} = \{1, 2, 8, 9, 19, 388, 776\} = 2^3 \cdot 97; D_{477} = \{1, 3, 21, 35, 111, 209, 777\}$
 $D_{478} = \{1, 2, 389, 778\} = 2 \cdot 389; D_{479} = \{1, 12, 41, 779\} = 3 \cdot 7 \cdot 37$
 $D_{480} = \{1, 2, 3, 6, 15, 16, 10, 12, 13, 15, 20, 26, 30, 39, 52, 60, 67, 78, 130, 156, 195, 260, 390, 780\} = 2^2 \cdot 3 \cdot 5 \cdot 13$
 $D_{481} = \{1, 11, 71, 781\}; D_{482} = \{1, 2, 17, 23, 34, 46, 391, 782\} = 2 \cdot 17 \cdot 23;$
 $= 11 \cdot 71$
 $D_{483} = \{1, 3, 9, 27, 29, 87, 261, 783\} = 3^3 \cdot 29; D_{484} = \{1, 2, 8, 13, 16, 28, 43, 56, 98, 112, 196, 392, 784\} = 2^2 \cdot 7 \cdot 2$
 $D_{485} = \{1, 5, 15, 785\} = 5 \cdot 15$
 $D_{486} = \{1, 2, 3, 6, 13, 26, 393, 786\} = 2 \cdot 3 \cdot 131 \rightarrow D_{487} = \{1, 787\}$
 $D_{487} = \{1, 2, 19, 39, 787\} = 2 \cdot 197; D_{488} = \{1, 3, 263, 788\} = 3 \cdot 263$
 $D_{489} = \{1, 2, 7, 13, 791\} = 7 \cdot 13$
 $D_{490} = \{1, 2, 5, 10, 79, 158, 395, 790\} = 2 \cdot 5 \cdot 79; D_{491} = \{1, 7, 13, 791\} = 7 \cdot 13$
 $D_{492} = \{1, 2, 3, 6, 8, 9, 11, 12, 18, 22, 24, 33, 36, 43, 66, 72, 88, 99, 132, 198, 264, 396, 792\} = 2^2 \cdot 3^2 \cdot 11$
 $D_{493} = \{1, 13, 61, 793\} = 13 \cdot 61; D_{494} = \{1, 2, 39, 794\} = 2 \cdot 397$
 $D_{495} = \{1, 3, 5, 15, 53, 159, 265, 795\} = 3 \cdot 5 \cdot 53; D_{496} = \{1, 2, 1, 199, 398, 796\} = 2^2 \cdot 199$
 $D_{497} = \{1, 797\}; D_{498} = \{1, 2, 3, 6, 13, 19, 21, 38, 42, 57, 133, 266, 399, 798\} = 2 \cdot 3 \cdot 19$
 $D_{499} = \{1, 1, 4, 799\} = 17 \cdot 47; D_{500} = \{1, 2, 5, 8, 10, 16, 20, 25, 32, 40, 50, 89, 100, 160, 200, 400, 800\} = 2^8 \cdot 5 \cdot 2$
 $D_{501} = \{1, 3, 9, 89, 267, 801\} = 3^2 \cdot 89; D_{502} = \{1, 2, 4, 6, 8, 10, 20, 25, 32, 40, 50, 89, 100, 160, 200, 400, 800\} = 2^8 \cdot 5 \cdot 2$
 $D_{503} = \{1, 11, 73, 803\} = 11 \cdot 73$
 $D_{504} = \{1, 2, 3, 6, 12, 6, 13, 20, 268, 402, 804\}; D_{505} = \{1, 5, 23, 85, 145, 161, 805\} = 2^2 \cdot 3 \cdot 23$
 $= 2 \cdot 3 \cdot 67$
 $D_{506} = \{1, 2, 13, 26, 31, 62, 403, 806\}; D_{507} = \{1, 3, 269, 807\} = 3 \cdot 269$
 $\approx 2 \cdot 13 \cdot 31$
 $D_{508} = \{1, 1, 809\}$

- $\Delta_{810} = \{1, 2, 3, 5, 6, 9, 10, 15, 18, 27, 30, 35, 53, 81, 90, 135, 162, 270, 305, 810\} = 2^3 \cdot 3^5$
 $\Delta_{811} = \{1, 811\}; \Delta_{812} = \{1, 2, 3, 4, 11, 28, 29, 58, 116, 203, 306, 812\} = 2^2 \cdot 7 \cdot 29;$
 $\Delta_{813} = \{1, 3, 27, 813\} = 3 \cdot 271; \Delta_{814} = \{1, 2, 11, 22, 37, 73, 207, 814\} = 2 \cdot 11 \cdot 37$
 $\Delta_{815} = \{1, 5, 163, 815\} = 5 \cdot 163; \Delta_{816} = \{1, 2, 3, 5, 6, 8, 12, 16, 17, 26, 33, 38, 51, 68, 102, 136, 203, 272, 308, 816\} = 2^2 \cdot 3 \cdot 17$
 $\Delta_{817} = \{1, 19, 53, 817\} = 19 \cdot 53$
 $\Delta_{818} = \{1, 2, 409, 818\} = 2 \cdot 409; \Delta_{819} = \{1, 3, 7, 9, 13, 21, 39, 63, 91, 117, 273, 819\} = 3^2 \cdot 7 \cdot 13$
 $\Delta_{820} = \{1, 2, 3, 5, 10, 20, 51, 82, 164, 205, 310, 820\} = 2^2 \cdot 5 \cdot 51; \Delta_{821} = \{1, 821\}$
 $\Delta_{822} = \{1, 2, 3, 6, 13, 27, 51, 822\} = 2 \cdot 3 \cdot 13$
 $\Delta_{823} = \{1, 3, 5, 11, 15, 25, 33, 55, 75, 165, 275, 823\}$
 $\Delta_{824} = \{1, 2, 3, 8, 103, 206, 512, 824\} = 2^3 \cdot 103; \Delta_{825} = \{1, 3, 5, 11, 15, 25, 33, 55, 75, 165, 275, 825\} = 3 \cdot 5 \cdot 11$
 $\Delta_{826} = \{1, 2, 7, 11, 59, 118, 53, 826\} = 2 \cdot 7 \cdot 59; \Delta_{827} = \{1, 827\}; \Delta_{828} = \{1, 828\} = 2^2 \cdot 3^2 \cdot 23$
 $\Delta_{829} = \{1, 2, 3, 6, 9, 12, 18, 23, 36, 56, 69, 92, 138, 203, 276, 513, 829\} = 3 \cdot 277$
 $\Delta_{830} = \{1, 2, 5, 10, 83, 166, 515, 830\} = 2 \cdot 5 \cdot 83; \Delta_{831} = \{1, 3, 27, 831\} = 3 \cdot 277$
 $\Delta_{832} = \{1, 2, 3, 8, 13, 16, 26, 32, 52, 67, 104, 208, 516, 832\} = 2^3 \cdot 3 \cdot 139$
 $\Delta_{833} = \{1, 2, 7, 11, 59, 118, 53, 833\} = 7^2 \cdot 17; \Delta_{834} = \{1, 2, 3, 6, 13, 27, 51, 834\} = 2^2 \cdot 11 \cdot 19$
 $\Delta_{835} = \{1, 5, 16, 835\} = 5 \cdot 167; \Delta_{836} = \{1, 2, 7, 11, 19, 22, 38, 55, 76, 209, 518, 836\} = 2^2 \cdot 11 \cdot 19$
 $\Delta_{837} = \{1, 3, 9, 27, 31, 93, 279, 837\} = 3^3 \cdot 31; \Delta_{838} = \{1, 2, 5, 19, 838\} = 2 \cdot 5 \cdot 19; \Delta_{839} = \{1, 839\}$
 $\Delta_{840} = \{1, 2, 3, 5, 6, 8, 10, 12, 14, 15, 20, 24, 27, 28, 30, 35, 50, 52, 56, 60, 70, 840\} = 2^2 \cdot 3^2 \cdot 11 \cdot 120$
 $\Delta_{841} = \{1, 2, 3, 5, 6, 8, 10, 12, 14, 15, 20, 24, 27, 28, 30, 35, 50, 52, 56, 60, 70, 841\} = 2^2 \cdot 3^2$
 $\Delta_{842} = \{1, 2, 7, 21, 842\} = 2 \cdot 7 \cdot 21; \Delta_{843} = \{1, 3, 281, 843\} = 3 \cdot 281; \Delta_{844} = \{1, 2, 3, 21, 522, 844\} = 2^2 \cdot 21$
 $\Delta_{845} = \{1, 5, 13, 65, 169, 845\} = 5 \cdot 13 \cdot 169; \Delta_{846} = \{1, 2, 3, 6, 9, 18, 57, 93, 131, 282, 523, 846\} = 2^2 \cdot 3^2 \cdot 53$
 $\Delta_{847} = \{1, 2, 3, 6, 11, 12, 18, 21, 847\} = 2 \cdot 3 \cdot 11^2; \Delta_{848} = \{1, 2, 5, 16, 53, 106, 212, 525, 848\} = 2^2 \cdot 5 \cdot 19$
 $\Delta_{849} = \{1, 3, 283, 849\} = 3 \cdot 283; \Delta_{850} = \{1, 2, 5, 10, 17, 25, 37, 50, 85, 110, 525, 850\} = 2 \cdot 5^2 \cdot 17$
 $\Delta_{851} = \{1, 2, 3, 7, 851\} = 23 \cdot 37; \Delta_{852} = \{1, 2, 3, 5, 6, 12, 21, 152, 213, 284, 526, 852\} = 2^2 \cdot 3 \cdot 71$
 $\Delta_{853} = \{1, 853\}$
 $\Delta_{854} = \{1, 2, 3, 6, 11, 12, 22, 52, 854\} = 2 \cdot 4 \cdot 61; \Delta_{855} = \{1, 3, 5, 9, 15, 19, 50, 55, 95, 171, 285, 855\} = 3^2 \cdot 5 \cdot 19$
 $\Delta_{856} = \{1, 2, 3, 8, 10, 21, 24, 28, 52, 856\} = 2^3 \cdot 107; \Delta_{857} = \{1, 857\}$
 $\Delta_{858} = \{1, 2, 3, 6, 11, 13, 22, 26, 33, 39, 66, 78, 113, 286, 529, 858\} = 2 \cdot 3 \cdot 11 \cdot 13; \Delta_{859} = \{1, 859\}$
 $\Delta_{859} = \{1, 2, 3, 5, 10, 20, 43, 86, 172, 245, 530, 860\} = 2 \cdot 5 \cdot 43; \Delta_{863} = \{1, 863\}$
 $\Delta_{860} = \{1, 2, 3, 6, 11, 12, 21, 51, 123, 287, 861\} = 3 \cdot 7 \cdot 51; \Delta_{862} = \{1, 2, 5, 13, 862\} = 2 \cdot 5 \cdot 43$
 $\Delta_{861} = \{1, 3, 7, 21, 51, 123, 287, 861\} = 3 \cdot 7 \cdot 51$
 $\Delta_{862} = \{1, 2, 5, 13, 862\} = 2 \cdot 5 \cdot 43$
 $\Delta_{863} = \{1, 5, 173, 863\} = 5 \cdot 173$
 $\Delta_{864} = \{1, 2, 3, 6, 8, 12, 16, 18, 21, 27, 32, 36, 58, 864\} = 2 \cdot 3 \cdot 13 \cdot 33.$
 $\Delta_{865} = \{1, 5, 173, 865\} = 5 \cdot 173$
 $\Delta_{866} = \{1, 2, 5, 13, 866\} = 2 \cdot 5 \cdot 43; \Delta_{867} = \{1, 3, 17, 51, 289, 867\} = 3 \cdot 17^2$
 $\Delta_{868} = \{1, 2, 5, 7, 11, 28, 31, 62, 127, 217, 534, 868\} = 2^2 \cdot 7 \cdot 31; \Delta_{869} = \{1, 11, 79, 869\} = 11 \cdot 79$
 $\Delta_{870} = \{1, 2, 5, 7, 11, 28, 31, 62, 127, 217, 534, 870\} = 2 \cdot 3 \cdot 5 \cdot 29$

- $D_{871} = \{1, 13, 67, 871\} = 13 \cdot 67$; $D_{872} = \{1, 27, 8, 109, 218, 536, 872\} = 2^3 \cdot 109$
 $D_{873} = \{1, 3, 9, 97, 291, 873\} = 3^2 \cdot 97$; $D_{874} = \{1, 219, 23, 38, 56, 537, 874\} = 219 \cdot 23$
 $D_{875} = \{1, 5, 7, 25, 35, 125, 175, 875\} = 5^3 \cdot 7$; $D_{876} = \{1, 23, 5, 6, 12, 43, 156, 219, 292\}$
 $D_{877} = \{1, 7, 877\}$; $D_{878} = \{1, 3, 439, 878\}$; $D_{879} = \{1, 3, 293, 879\} = 3 \cdot 293$; $D_{880} = \{1, 881\}$
 $D_{880} = \{1, 2, 4, 5, 8, 10, 11, 16, 20, 22, 50, 54, 85, 80, 88, 110, 176, 220, 550, 880\} = 2^5 \cdot 5 \cdot 11$
 $D_{882} = \{1, 2, 3, 6, 7, 9, 13, 18, 21, 22, 59, 63, 98, 126, 147, 295, 551, 882\} = 2 \cdot 3^2 \cdot 7^2$
 $D_{883} = \{1, 883\}$; $D_{884} = \{1, 2, 3, 13, 17, 26, 34, 12, 68, 221, 542, 884\} = 2^2 \cdot 13 \cdot 17$
 $D_{885} = \{1, 3, 5, 15, 53, 875, 295, 885\} = 3 \cdot 5 \cdot 59$; $D_{886} = \{1, 2, 53, 886\} = 2 \cdot 53$; $D_{887} = \{1, 887\}$
 $D_{888} = \{1, 2, 3, 4, 6, 8, 12, 24, 35, 74, 111, 148, 222, 296, 555, 888\} = 2^3 \cdot 3 \cdot 37$
 $D_{889} = \{1, 2, 5, 10, 89, 178, 555, 889\} = 2 \cdot 5 \cdot 89$
 $D_{889} = \{1, 2, 12, 889\} = 2 \cdot 127$; $D_{890} = \{1, 2, 5, 10, 89, 178, 555, 889\} = 2^2 \cdot 223$
 $D_{891} = \{1, 3, 9, 11, 27, 33, 81, 99, 297, 891\} = 3^3 \cdot 11$; $D_{892} = \{1, 2, 3, 223, 556, 892\} = 2 \cdot 3 \cdot 149$
 $D_{893} = \{1, 13, 47, 893\} = 13 \cdot 47$; $D_{894} = \{1, 2, 3, 6, 159, 298, 524, 894\} = 2 \cdot 3 \cdot 149$
 $D_{895} = \{1, 5, 179, 895\} = 5 \cdot 179$; $D_{896} = \{1, 2, 3, 7, 8, 13, 16, 28, 32, 56, 67, 112, 128, 225, 548, 896\} = 27 \cdot 7$
 $D_{897} = \{1, 3, 13, 23, 39, 69, 299, 897\} = 3 \cdot 13 \cdot 23$; $D_{898} = \{1, 2, 559, 898\} = 2 \cdot 559$
 $D_{899} = \{1, 2, 9, 31, 899\} = 29 \cdot 31$; $D_{900} = \{1, 2, 3, 4, 5, 6, 9, 10, 12, 15, 18, 20, 25, 30, 36, 55, 503, 60, 75, 90, 100, 150, 180, 225, 300, 500, 900\}$
 $D_{901} = \{1, 2, 53, 901\} = 17 \cdot 53$
 $D_{902} = \{1, 2, 11, 22, 51, 82, 451, 902\} = 2 \cdot 11 \cdot 51$; $D_{903} = \{1, 3, 7, 21, 43, 129, 301, 903\} = 3 \cdot 7 \cdot 53$
 $D_{904} = \{1, 2, 3, 8, 13, 226, 552, 904\} = 2^3 \cdot 113$; $D_{905} = \{1, 5, 181, 905\} = 5 \cdot 181$
 $D_{906} = \{1, 2, 3, 6, 15, 30, 53, 906\} = 2 \cdot 3 \cdot 151$; $D_{907} = \{1, 907\}$; $D_{908} = \{1, 2, 3, 227, 555, 908\} = 2^2 \cdot 227$
 $D_{909} = \{1, 3, 9, 10, 23, 909\} = 3^2 \cdot 101$; $D_{910} = \{1, 2, 5, 7, 10, 13, 15, 26, 35, 65, 70, 91, 130, 182, 505, 910\} = 2 \cdot 5 \cdot 7 \cdot 13$
 $D_{911} = \{1, 911\}$; $D_{912} = \{1, 2, 3, 4, 6, 8, 12, 16, 19, 24, 38, 58, 57, 76, 114, 152, 228, 304, 456, 912\} = 2^2 \cdot 3 \cdot 19$
 $D_{913} = \{1, 11, 13, 913\} = 11 \cdot 93$; $D_{914} = \{1, 2, 4, 914\} = 2 \cdot 914$
 $D_{915} = \{1, 3, 5, 15, 61, 183, 305, 915\} = 3 \cdot 5 \cdot 61$; $D_{916} = \{1, 2, 3, 229, 558, 916\} = 2^2 \cdot 229$
 $D_{917} = \{1, 7, 13, 917\} = 7 \cdot 131$; $D_{918} = \{1, 2, 3, 6, 9, 17, 48, 27, 34, 51, 53, 102, 153, 306, 553, 918\} = 2 \cdot 3^2 \cdot 17$
 $D_{919} = \{1, 919\}$; $D_{920} = \{1, 2, 5, 8, 10, 20, 23, 50, 56, 92, 115, 187, 230, 560, 920\} = 2^3 \cdot 5 \cdot 23$
 $D_{921} = \{1, 3, 307, 921\} = 3 \cdot 307$; $D_{922} = \{1, 2, 561, 922\} = 2 \cdot 561$; $D_{923} = \{1, 13, 21, 923\}$
 $D_{924} = \{1, 2, 3, 4, 6, 7, 11, 12, 13, 21, 22, 28, 33, 52, 64, 66, 77, 84, 132, 83, 231, 2308, 562\} = 13 \cdot 71$
 $D_{925} = \{1, 5, 25, 37, 185, 925\} = 5^2 \cdot 37$; $D_{926} = \{1, 2, 563, 926\} = 2 \cdot 563$
 $D_{927} = \{1, 3, 9, 103, 309, 927\} = 3^2 \cdot 103$; $D_{928} = \{1, 2, 3, 8, 16, 29, 32, 58, 116, 232, 564, 928\} = 2^2 \cdot 29$
 $D_{929} = \{1, 929\}$; $D_{930} = \{1, 2, 3, 5, 6, 10, 15, 30, 31, 62, 93, 105, 186, 310, 565, 930\} = 2 \cdot 3 \cdot 5 \cdot 31$
 $D_{931} = \{1, 7, 19, 49, 102, 221\}$

$$Dg_{32} = \{1, 2, 4, 233, 466, 932\} = 2^2 \cdot 233; Dg_{33} = \{1, 3, 311, 933\} = 3 \cdot 311$$

$$Dg_{34} = \{1, 2, 4, 67, 934\} = 2 \cdot 467; Dg_{35} = \{1, 5, 11, 13, 85, 187, 935\} = 5 \cdot 11 \cdot 17$$

$$Dg_{36} = \{1, 2, 3, 4, 6, 8, 9, 12, 13, 18, 24, 26, 36, 38, 52, 72, 78, 104, 117, 156, 234, 313, 568, 936\} = 2^3 \cdot 3^2 \cdot 13; Dg_{37} = \{4, 937\}$$

$$Dg_{38} = \{1, 2, 4, 13, 67, 134, 469, 938\} = 2 \cdot 7 \cdot 67; Dg_{39} = \{1, 3, 313, 939\} = 3 \cdot 313$$

$$Dg_{40} = \{1, 2, 4, 10, 20, 47, 94, 188, 235, 470, 940\} = 2^2 \cdot 5 \cdot 47; Dg_{41} = \{4, 941\};$$

$$Dg_{42} = \{1, 2, 3, 6, 15, 31, 47, 942\} = 2 \cdot 3 \cdot 157; Dg_{43} = \{1, 23, 31, 943\} = 23 \cdot 31$$

$$Dg_{44} = \{1, 2, 4, 8, 16, 59, 118, 236, 472, 944\} = 2^3 \cdot 59$$

$$Dg_{45} = \{1, 3, 5, 9, 15, 24, 27, 30, 45, 63, 105, 135, 189, 315, 945\} = 3^3 \cdot 5 \cdot 7$$

$$Dg_{46} = 2 \cdot 11 \cdot 43 = \{1, 2, 11, 22, 43, 86, 473, 946\}; Dg_{47} = \{4, 947\}$$

$$Dg_{48} = 2^2 \cdot 3 \cdot 79 = \{1, 2, 3, 4, 6, 12, 79, 108, 237, 316, 474, 948\}$$

$$Dg_{49} = \{1, 3, 73, 949\} = 13 \cdot 73; Dg_{50} = \{1, 3, 10, 19, 25, 38, 50, 95, 190, 475, 950\} = 2 \cdot 5^2 \cdot 19$$

$$Dg_{51} = \{1, 3, 31, 951\} = 3 \cdot 317$$

$$Dg_{52} = \{1, 2, 4, 8, 13, 17, 28, 34, 56, 68, 119, 136, 238, 476, 952\} = 2^3 \cdot 7 \cdot 17$$

$$Dg_{53} = \{1, 953\}; Dg_{54} = 2 \cdot 3^2 \cdot 53 = \{1, 2, 3, 6, 9, 18, 53, 106, 159, 318, 474, 953\}$$

$$Dg_{55} = \{1, 17, 191, 955\} = 5 \cdot 191$$



Curs 1 - ~~știință~~
nof Sree

-1-

13.01.2023

Grup

- (6, ·) grup. 6 multime, operatie pe 6
 • $6 \times 6 \rightarrow G$
 • $(x, y) \in G \Rightarrow (x \cdot y) \in G$ - nu este injectivă

$$6 \times 6 = \{ (x, y) \mid x, y \in G \}$$

Proprietăți:

- 1) $x \cdot (y \cdot z) = (x \cdot y) \cdot z$, $\forall x, y, z \in G$ (operatie este asociativă)
 2) $\exists e \in G$ a.s. $e \cdot g = g \cdot e = g \quad \forall g \in G$ e-elementul neutru (este unic)
 3) $\forall x \in G \Rightarrow \exists y \in G$ a.s. $x \cdot y = y \cdot x = e$ (y se numește inversul lui x)
 $y = x^{-1}$

(6, +) operatie

(6, +)

(6, *)

Exemplu de grupuri: $(\mathbb{Z}, +)$, $(\mathbb{Q}^*, +)$, (\mathbb{Q}^*, \cdot)

element neutru = 0

inversul lui $x := -x$

$(\mathbb{Z}_n, +)$ $n \in \mathbb{N}, n \geq 2$ fixat

$(\cup (\mathbb{Z}_n), \cdot)$

close $\boxed{a = b}$, $a, b \in \mathbb{Z} \Leftrightarrow \boxed{n \mid a - b}$ (diferență)

\mathbb{Z}_{12} , $\widehat{1} = 1$ în \mathbb{Z}_{12}

$(\mathbb{Z}_n, +)$ $\widehat{a} + \widehat{b}$

grup cu n elemente: $\widehat{0}, \widehat{1}, \widehat{2}, \dots, \widehat{n-1}$

$\widehat{0} = \widehat{n}$

$\widehat{1} = \widehat{n+1}$

Elementul neutru: $\widehat{0}$

Inversul lui \widehat{x} este $-\widehat{x}$.

$\widehat{1} + \widehat{1} = \widehat{0}$ - inversul lui 1

în \mathbb{Z}_{12} ca adunare

$\widehat{2} + \widehat{10} = \widehat{0}$ - u - 2 (în \mathbb{Z}_{12})

$\widehat{3} + \widehat{9} = \widehat{0}$

$$\begin{array}{l} \widehat{2} + \widehat{8} = \widehat{0} \\ \widehat{5} + \widehat{7} = \widehat{0} \\ \widehat{6} + \widehat{6} = \widehat{0} \end{array}$$

- perbedrate

- cicle, $n =$ lungimea ciclului.

- 2-

$U(\mathbb{Z}_n)$ - grup matrital, ATENȚIE!!!

Peste sopt-oare!

unitate

$$U(\mathbb{Z}_n) = \{ \hat{a} \mid a \in \mathbb{Z}, (a, n) = 1 \} \quad n \neq 1, n \geq 2$$

$$\mathbb{Z}_{12} = \{ \hat{0}, \hat{1}, \hat{2}, \hat{3}, \hat{4}, \hat{5}, \hat{6}, \hat{7}, \hat{8}, \hat{9}, \hat{10}, \hat{11} \}$$

$$U(\mathbb{Z}_{12}) = \{ \hat{1}, \hat{5}, \hat{7}, \hat{11} \} \quad \text{multime cu 4 elemente}$$

prime cu 12

$$(a, 12) = 1$$

$$\begin{aligned} \text{cmmdc} & (0, 12) = 12 \\ & (2, 12) = 2 \end{aligned}$$

$$\begin{array}{c} \hat{0}, \hat{2}, \hat{3}, \hat{6}, \hat{8}, \hat{9}, \hat{10} \\ \hat{2}, \hat{3}, \hat{6}, \hat{8}, \hat{9}, \hat{10} \\ (3, 12) = 3 \end{array} \quad \text{cmmdc}$$

$$\mu(\mathbb{Z}_{12})$$

$$(35 : 12) = 2\text{ rest }11$$

$\hat{2} \cdot \hat{6}$

Elementul neutru: $\hat{1}$ (deza, de 1)

$$\hat{5} \cdot \hat{5} = \hat{25} = \hat{1} \quad 25 = 2 \cdot 12$$

$$\hat{7} \cdot \hat{7} = \hat{49} = \hat{1} \quad 49 = 4 \cdot 12$$

$$\hat{11} \cdot \hat{11} = \hat{1} \quad [(-1) \cdot (-1) = 1]$$

$$\hat{11} = -\hat{1}$$

$$\hat{5} \cdot \hat{7} = \hat{35} = \hat{11}$$

$$12 | 35 - 11 = 23$$

Exemplu: $U(\mathbb{Z}_{31}) = \{ \hat{1}, \hat{2}, \dots, \hat{30} \} \quad m \mathbb{Z}_{31}$

$31 = \text{nr. prim}$

$$\hat{2} \cdot \hat{16} = \hat{1}$$

$$\hat{2} \cdot \hat{16} = \hat{32} = \hat{1} \quad m \mathbb{Z}_{31}$$

Algoritm RSA \rightarrow Adăugare

- criptare \rightarrow de transmis mesaj, se numește antielegor.

1978 Rivest Shamir

- criptare cu cheie publică

$$(n, e)$$

$$n = p \cdot q \quad p, q = \text{nr. prime distincte, mari!}$$

$p, q = \text{secrete}$

Nu se spune produsul.

$$(e, (p-1)(q-1)) = 1$$

(e este prim cu $p-1$ și $q-1$)

-3-

$$U(\mathbb{Z}_{31}) \rightarrow 3\text{. Ebene}$$

$$\widehat{3} \cdot \widehat{12} = \widehat{36}$$

$$36 : 31 = \frac{3}{5} \text{ rest } 5$$

$$\boxed{\widehat{1} \cdot \widehat{1} = \widehat{1}}$$

$$\begin{cases} \widehat{2} \cdot \widehat{16} = \widehat{1} \\ \text{times} \\ \widehat{3} \cdot \widehat{21} = \widehat{63} = \widehat{1} \end{cases}$$

$$1+31=32 \quad 32 : 3 ; \quad 32 \text{ ist ein Restmodul 3}$$

$$1+31+31=63 \quad (\text{es Restmodul 3})$$

$$\text{Zn } \widehat{a} = \widehat{b} \Leftrightarrow a \equiv b \pmod{31}$$

$$\text{Universal div } \widehat{2} \cdot \widehat{8} = \widehat{1} \quad 7 = \widehat{32} = \widehat{63} = \widehat{95} = \widehat{125}$$

$$\text{in } \mathbb{Z}_{31}$$

$$\begin{array}{r} 95 + \\ 31 \\ \hline 126 \end{array}$$

$$\widehat{2} \cdot \widehat{9} = \widehat{1}$$

$$\widehat{2} \cdot \widehat{25} = \widehat{1}$$

$$\widehat{6} \cdot \widehat{26} = \widehat{1} \quad \text{Universal div 5.}$$

Multiplikationsschleife Intervalle

$$\widehat{1} = -\widehat{30} \quad (\text{differente Ringe}) = -1$$

$$= \widehat{5} \cdot (-\widehat{6}) = \widehat{5} \cdot \widehat{25}$$

$$\widehat{1} = \widehat{6} \cdot (\widehat{5}) = \widehat{6} \cdot \widehat{26}$$

$$\text{Universal div 10} \quad -\widehat{10} \cdot (-\widehat{3}) = \widehat{1}$$

$$\widehat{10} \cdot \widehat{28} = \widehat{1}$$

A multiplikative Gruppe

$|A| = \text{ord}(\text{ord} \text{ multgruppe } A)$

$$\boxed{\widehat{30} \cdot \widehat{30} = \widehat{1}}$$

$$\widehat{10} = -1 \text{ in } \mathbb{Z}_{31}$$

$$\widehat{1}, \widehat{30}$$

$$\widehat{11} \cdot \widehat{17} = \widehat{1}$$

Important

(6, ·) Gruppe

$$x \cdot y = x \cdot z \Rightarrow y = z$$

(in Gruppe nicht abhängig)

$$x \cdot y = z \cdot x \Rightarrow ?$$

14. eg. div 31 (core se gruppe ord 2)

12.

$$\boxed{|U(\mathbb{Z}_{31})| = 30}$$

$$\text{Def: } \widehat{11} \cdot \widehat{x} = \widehat{1} \mid \widehat{3} \quad \text{multgruppe } \mathbb{Z}_3 \quad \widehat{31} \quad \rightarrow \text{Am } \widehat{3} \text{ multiplikativ}$$

Ademus 31, ..., phasen Restmodul 11.

($\widehat{11} \cdot x \Rightarrow$ es ist no. Gruppe der 31)

$$\widehat{33} \cdot \widehat{x} = \widehat{3} \quad \text{in } \mathbb{Z}_{31}$$

$$\widehat{2} \cdot \widehat{x} = \widehat{3} = \widehat{31} = \widehat{2} \cdot \widehat{17} \quad (\text{not abhängig von } 2)$$

$$\boxed{\widehat{x} = \widehat{17}} \quad (31+3)$$

$$\widehat{12} \cdot \widehat{x} = \widehat{4} \cdot \widehat{3} \quad | \cancel{K_{31}}$$

$$\widehat{36} \cdot \widehat{x} = \widehat{3}$$

$$\frac{4}{5} \cdot \widehat{x} = \widehat{3} = \widehat{65} = \widehat{5} \cdot \widehat{13}$$

$$\boxed{\widehat{x} = \widehat{13}}$$

$$\widehat{12} \cdot \widehat{13} = \widehat{1}$$

$$\widehat{19} \cdot \widehat{20} = \widehat{1}$$

\downarrow Inverso

$$\widehat{15} \cdot \widehat{x} = \widehat{1}$$

$$\widehat{15} \cdot \widehat{2} = \widehat{30} = \widehat{1}$$

$$\widehat{15} \cdot (\widehat{-2}) = \widehat{1}$$

\downarrow
 29

$$\widehat{15} \cdot \widehat{29} = \widehat{1}$$

\downarrow Inverso de 15

(17º apartir da 1).

$$\widehat{18} \cdot \widehat{x} = \widehat{1} \quad | \cdot \widehat{2} \rightarrow \text{m } \cancel{K_{31}}$$

$$\widehat{36} \cdot \widehat{x} = \widehat{2}$$

$$\widehat{5} \cdot \widehat{x} = \widehat{2} \quad | \cdot \widehat{6} \quad \text{com o mesmo grupo de 31}$$

$$\widehat{-x} = \widehat{30} \cdot \widehat{x} = \widehat{12} \quad | \cdot (-1)$$

$$\widehat{x} = -\widehat{12} = \widehat{19}$$

$$\text{Debil } \widehat{18} \cdot \widehat{19} = \widehat{1} \quad \text{Inverso de 18.}$$

$$\widehat{22} \cdot \widehat{x} = \widehat{1}$$

$$\widehat{-9} \cdot \widehat{x} = \widehat{1} \quad | \cdot \widehat{7} \quad \text{Inverso de 9 = 7}$$

$$\widehat{x} = \widehat{7} = \widehat{25}$$

$$\widehat{22} \cdot \widehat{25} = \widehat{1}$$

$$\widehat{23} \cdot \widehat{25} = \widehat{1}$$

$$K_m \quad a = b \Leftrightarrow n/a = b$$

-h-

$$3+31$$

$$3+62=65$$

65 se multiplica

$$\widehat{15} \cdot \widehat{x} = \widehat{1} \cdot \widehat{2}$$

$$\widehat{28} \cdot \widehat{x} = \widehat{2}$$

$$\widehat{-3} \cdot \widehat{x} = \widehat{2} = (2+31) = \widehat{33}$$

$$\widehat{x} = -\widehat{11} = \widehat{20} \text{ m } \cancel{K_{31}}$$

$$\boxed{\widehat{x} = 20}$$

$$\widehat{18} \cdot \widehat{x} = \widehat{1}$$

$$\frac{27}{23}$$

$$\widehat{62} = \widehat{1}$$

$$\begin{array}{r} 81 \\ 621 \end{array}$$

$$620 = 31 \cdot 20$$

(se multiplica 20)

Algorithm RSA - continue

$$|\mathbb{U}(\mathbb{Z}_n)| = (p-1)(q-1)$$

odd and even group

$$|\mathbb{U}(\mathbb{Z}_{91})| = 91 - 13 - 6 = 91 - 19 - \cancel{72} = \cancel{\frac{(p-1)}{2}} \cdot \cancel{\frac{(q-1)}{2}} = 6$$

$$\mathbb{U}(\mathbb{Z}_n) = \{ \hat{a} \mid (a, n) = 1 \}$$

prime

$$\hat{0}, \hat{1}, \hat{2}, \dots, \hat{90}$$

$$\hat{+} 13 = 91 \quad \text{prime}$$

$$\begin{array}{c} \hat{0}, \hat{1}, \hat{2}, \dots, \hat{90} \\ \hat{0}, \hat{9}, \dots, \hat{85} \\ \circled{0}, \hat{13}, \dots, \hat{88} \\ (6 \cdot 13) \end{array}$$

$p < q$ mit prime distance

$$|\mathbb{U}(\mathbb{Z}_{pq})| = p \cdot 2 - 2 - (p-1) = p_2 - p - 2 + 1 = (p-1)(q-1)$$

$$\hat{0}, \hat{1}, \dots, \hat{p_2-1}$$

$$\hat{0}, \hat{1}, \dots, \hat{p(q-1)}$$

$$\hat{0}, \hat{1}, \dots, \hat{2(p-1)} \quad \text{since } p \text{ (ne } \hat{0} \text{ l-aus was).}$$

$$\hat{2} \cdot \hat{6} = \hat{2} \cdot \hat{0} \quad \hat{2} \notin \mathbb{U}(\mathbb{Z}_{12}) \quad \text{dort doch e in group}$$

$$\hat{6} \neq \hat{0} \quad (\text{nu e aderordt!})$$

6 ist primen strophische

\mathbb{Z}_m

$$\hat{a} \cdot \hat{x} = \hat{a} \cdot \hat{y} \Rightarrow \hat{x} = \hat{y}$$

$$\hat{a} \in \mathbb{U}(\mathbb{Z}_n) \Rightarrow (a, n) = 1$$

dort doch e prim an n

(primen strophische)

Cryptos

Alphabet (public)

9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

\mathbb{Z}_{26}

$$26^k < n < 26^{k+1}$$

$$n = 26^k = p \cdot 2$$

$$\text{Decat } k=1 ; 26 = 2 \cdot 13$$

~~so that~~

o se reemplaza de k simbolos! se transforma para una de $k+1$ simbolos!

$$\text{N.B. } x = \overbrace{a_{k-1}a_{k-2} \dots a_1 a_0}^{\text{separare}} \xrightarrow{b_k b_{k-1} \dots b_1 b_0}$$

$$x = a_{k-1} \cdot 2^k + a_{k-2} \cdot 2^{k-1} + \dots + a_1 \cdot 2^1 + a_0$$

- In loc de C scriem 2.

- nr. de valori le pot avea e i des foarte multe impotrivă.

Calculăm restul împărțirii lui x la n .

$$\text{R.R. scriem mulțimea } 2^k : r = b_k \cdot 2^k + \dots + b_1 \cdot 2^1 + b_0$$

$\text{mulțimea } 2^k, b_j \in \{0, \dots, 2^k\}$

$$\frac{k}{\underline{k}} \quad \frac{k}{\underline{1}} \quad \frac{k}{\underline{1}}$$

Algoritmul lui Euclid pentru cea mai mare divizor comun (CMDC)

$$U(\mathbb{Z}_{31})$$

$$\tilde{a} \cdot \tilde{x} = 1 \quad (U(\mathbb{Z}_n)) \quad (a, b) = 1$$

Algoritmul lui Euclid pt. cea mai mare divizor comun

$$b = a$$

$$a = q_1 \cdot \boxed{s_1} + r_1$$

$$b > a > r_1 > r_2 > \dots > r_m > 0$$

$$a = q_2 \cdot \boxed{s_2} + r_2$$

$$r_1 = q_2 \cdot \boxed{s_3} + r_3$$

$$r_{m-2} = r_{m-1} \cdot \boxed{s_m} + r_m$$

(a, b)
CMDC este astăzi
(n ca și număr)

$$r_{m-1} = r_m \cdot \boxed{s_{m+1}} + 0 \quad \begin{matrix} \text{nu se face ultima căl.} \\ \text{se omite}\end{matrix}$$

Calculăm factorul redusării

$$\frac{B}{A} = q_1 + \frac{1}{q_2 + \frac{1}{q_3 + \dots + \frac{1}{q_{m+1}}}} \quad (\text{se omite } q_{m+1})$$

$$\frac{b}{a} = \frac{B}{A} = \frac{(-1)^{m+1}}{a \cdot A} = \frac{(-1)^{m+1}}{a \cdot A} \quad | \cdot a \cdot A$$

$$(b \cdot A - a \cdot B) = (-1)^{m+1}$$

$$\text{dispare } -\widehat{a \cdot B} = (-1)^{m+1}$$

$$\widehat{b \cdot A} = \widehat{0}$$

$$\widehat{a \cdot B} = (-1)^{m+1} \cdot (-1)^m$$

$$\hat{a} \cdot (-1)^m \cdot B \Rightarrow \hat{x} = (-1)^m \cdot B$$

$$\hat{x} = \hat{y}$$

$m | x-y$ (diferente)
divide

Exemplu $\mathbb{U}(7)$

$$23 \cdot \hat{x} = 1 \text{ in } \mathbb{U}(7)$$

$$23 = 2 \cdot 11 + 1$$

$$2 = 1 \cdot 2 \text{ se divide}$$

$$\begin{array}{r} 71:23=3 \\ 69 \\ \hline 22 \end{array}$$

restul

$$3 + \frac{1}{11} = \frac{35}{11} \quad \text{3 opere}$$

$$\frac{71}{23} - \frac{35}{11} = \frac{(-1)}{23 \cdot 11} = -\frac{1}{23 \cdot 11}$$

$$\begin{array}{r} 71 \\ 71 \\ \hline 781 \end{array}$$

$$23 \cdot 3\hat{1} = 1$$

$$23 \cdot 3\hat{4} = 1$$

$$\boxed{\hat{x} = 3\hat{4}}$$

$$\boxed{71 \cdot 11 - 23 \cdot 3\hat{4} = -1}$$

$$\boxed{781 - 782 = -1 \quad \checkmark \text{ OK}}$$

Seu nr. = $3\hat{4}$

$$\begin{array}{r} 23 \\ 35 \\ \hline 92 \\ 69 \\ \hline 782 \end{array}$$

Soluție:

$$23 \cdot \hat{x} = 1 \cdot \hat{3} \quad \text{se adună grupuri de } 71 - \text{ în multe cu } 3$$

$$\begin{array}{l} \text{in } \mathbb{U}(7) \\ 23 \cdot \hat{x} = 3 \\ -2 \cdot \hat{x} = 3 \mid \text{in } \mathbb{U}(7) \\ 2 \hat{x} = -3 = (\hat{1} - 3) = \hat{6} \Rightarrow \hat{x} = \hat{6} \cdot \hat{2} = 3\hat{4} \end{array}$$

$$\boxed{\hat{x} = 3\hat{4}} \quad \text{doar liz mre, fără înmulțiri successive.}$$

$\mathbb{U}(2024)$

$$\begin{array}{r} 2024 \mid 8 \\ \hline 16 & 253 \mid 11 \\ \hline 42 & 22 \mid 23 \\ \hline 10 & 23 \end{array}$$

$$2024 = 163 \cdot \boxed{12} + 68$$

$$163 = 68 \cdot \boxed{2} + 27$$

$$68 = 27 \cdot \boxed{12} + 15$$

$$27 = 14 \cdot \boxed{1} + 13$$

$$13 = 13 \cdot \boxed{1} + 1$$

$$163 \cdot \hat{x} = 1$$

ctd nr. sunt nr. - acel algoritm

$$\begin{array}{r} 2024 \mid 163 \\ \hline 163 & 12 \\ \hline 394 & \\ 326 & \\ \hline 68 & \end{array}$$

$$\begin{array}{r} 68 \\ \hline 2 \\ \hline 136 \end{array}$$

$$12 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{1}}}} = 12 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{1}}}}$$

$$\begin{array}{r} 163 - 136 \\ \hline 227 \end{array}$$

$$\begin{array}{r} 136 \\ \hline 227 \end{array}$$

$$= 12 + \frac{1}{2 + \frac{2}{5}} = 12 + \frac{5}{12} = \frac{149}{12}$$

$$\frac{2024}{163} - \frac{149}{12} = \frac{1}{163 \cdot 12}$$

$$2024 \cdot 12 - 163 \cdot 149 = 1$$

amifor 24288 - 24287

$$U(\mathbb{Z}_{2024})$$

$$U(\mathbb{Z}_{2024})$$

$$\widehat{163} \cdot \widehat{x} = \widehat{1}$$

$$\widehat{x} = -\widehat{149} =$$

$$\widehat{163} \cdot (-\widehat{149}) = \widehat{1}$$

$$\boxed{\widehat{x} = -\widehat{149} = \widehat{1875}}$$

$$\begin{array}{r} 2024 \\ 149 \\ \hline 1875 \end{array}$$

Teorema lui Lagrange

(6,.) grup finit, $g \in G \Rightarrow |g^{16}| = e$ element neutral grupului

$g \in G$, G grup, $n \in \mathbb{N}$

$$g^n = \begin{cases} e, & n=0 \\ g, & n=1 \end{cases}$$

$$g^{n+1}, g, n \geq 2$$

Consecutiv:

Mica teorema \widehat{g} din Teorema

$$1) \forall a \in \mathbb{Z}, p \text{ prim}, p \nmid a \Rightarrow \boxed{a^{p-1} = 1 \text{ in } U(\mathbb{Z}_p)}$$

$$|U(\mathbb{Z}_p)| = p-1 \text{ elemente}$$

$$U(\mathbb{Z}_p) = \{ \widehat{1}, \widehat{2}, \dots, \widehat{p-1} \}$$

$$\widehat{0}, \widehat{1}, \widehat{2}, \dots, \widehat{p-1}$$

$$U(\mathbb{Z}_n) = \{ \widehat{a} | (a, n) = 1 \} - \text{al scot pe } 0.$$

$$p \nmid a \Rightarrow \widehat{a} \in U(\mathbb{Z}_p) \xrightarrow{\text{Lagrange}} |\widehat{a}|_{U(\mathbb{Z}_p)} = p-1$$

deoarece

$$\widehat{a}^{p-1} = 1 \Rightarrow \boxed{\widehat{a}^{p-1} = 1}$$

2) Teorema Euler

$$(a, n) = 1, a \in \mathbb{Z}, n \in \mathbb{N}, n \geq 2$$

$$\Rightarrow \widehat{a}^{\phi(n)} = 1, U(\mathbb{Z}_n)$$

-9-

$$\varphi(n) = n \cdot \prod_{p|n} \left(1 - \frac{1}{p}\right)$$

p prim
 $p|n$

ordinele $|U(Z_n)| = \varphi(n)$
multimi

Apliсație: $\overline{2023}^{1999} = 100 \cdot 2 + k \rightarrow k \in S_{\{1, \dots, 99\}}$

Ultimile 2 cifre ale

ultimocifra \rightarrow se determină cu ajutorul mat. (dintre n și m care repetă).
- la fel ca $3^3 \rightarrow$ se determină mult. scădere cu 2

7

Răstul împărțirii la 100.

$$\overline{23}^{1999} = \overline{2023}^{1999} \stackrel{\text{mod}}{=} R \rightarrow \overline{R}_{100},$$

$2023 \geq 100 = 20$
~~200~~
~~2023 - 200~~
~~23~~

$\overline{2023} = \overline{23}$ în Z_{100} (fără diferență cu 2000),

$$(\overline{23}_{100}) = 1 \rightarrow \overline{23} \varphi(100) = 1$$

comună cu 100

$$\boxed{\varphi(100) = 100 \cdot \left(1 - \frac{1}{2}\right) \left(1 - \frac{1}{5}\right) = 100 \cdot \frac{1}{2} \cdot \frac{4}{5} = 40}$$

în primă fază de calcul

de ce $\overline{23} = 1$

$$|U(Z_{100})| = 40$$

ordinele

$$|U(Z_n)| = \varphi(n)$$

$0, 1, 2, \dots, 99$ sunt 100.

Avem:

$$|U(Z_{100})| = 100 - 50 - 10 = 40$$

ordinele

pe secundă

$0, 2, 4, \dots, 98$ - 50 clase - în parte (cu 2)

$5, 10, \dots, 95$ - 10 clase (cu 5)

$$\overline{23}^{39} = \overline{R} \cdot \overline{23} \overline{Z_{100}} \rightarrow \overline{23}^{30} \text{ fără 1} \quad \text{Menenționăm}$$

Soluție: $\overline{23}^{30} = \overline{R} \cdot \overline{23}$, $\overline{Z_{100}}$

$$\begin{array}{r} 1999 \\ | 100 \\ \hline 999 \\ | 100 \\ \hline 90 \end{array}$$

$$\begin{array}{r} 23 \\ | 87 \\ \hline 161 \\ | 87 \\ \hline \end{array}$$

prim

$\overline{R} = \overline{87}$

- 2001 ult. cifre

Algorithmus Euklid

-10-

100:23=4

- 1: $100 = 23 \cdot 4 + 8$
- 2: $23 = 8 \cdot 2 + 7$
- 3: $8 = 7 \cdot 1 + 1$
- 4: $7 = 1 \cdot 7$

$$h + \frac{1}{2+7} = h + \frac{1}{3} = \frac{13}{3}$$

$$\frac{100}{23} - \frac{13}{3} = \frac{1}{3 \cdot 23}$$

$$3|100 - 23 \cdot 13 = 1$$

$$23 \cdot (-13) = 7 \quad z_{100}$$

$$-13 = 87$$

Schreib 2023 um 2025¹⁹⁹⁹ → ultimale 2 cifre
2025¹⁹⁹⁹

obere Zahl → nun ebnen an los

$\frac{25}{25} \neq 1 \quad (25, 100) = 1$ - nun poten optisch gleiche aus
 commd.c ≠ 1 100 25

$$2025^{1999} = 25^a$$

$$2025^{1999} = 25^b + 25 = 25^a$$

$$2025 = 0$$

$$(-1)^{1999} = -1 = 25$$

$$2025^{1999} = 100^2 + 25 \rightarrow$$

=

$$\cancel{25(25+1)}, \cancel{100, 1, 2, 3, 4}$$

$$5/25h \Rightarrow 5/h \text{ flach.c}$$

100, c + 25 (restl. doppelt so viel wie 100-e 25)

(n/25)

descripte x CAC → +3 lo freies semm

J J J F D

+3

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
 0 1 2 3 4 5 6 7 8 9

ATAC
 ↓ ↓ ↓ ↓
 D M I D F

→ 25 doppelord!
 cu(2) → AS made → i see for...
 4 terms before

Test 1 Algebra

三

- Test 4 Algebra

 - Să se rezolve ecuația $x \in \{1, 2, \dots, 150\}$ astfel încât $37 \cdot x = 7$ să
verifice relația $U(K_{151})$. $\boxed{x=79}$
 - Ce sunt ultimele 2 cifre ale lui 193^{197} ? $\boxed{19}$

$$3 - 4 = 195^{197}?$$

4) Ge este nuclii importanți din $2^{97} + 3^{98} + 5^{99}$ le își?

5) Decrypted XCAE (cesar). \mathbb{Z}_{26} , +r

Pershing

$$\text{Resolvem: } \text{Dinăuntru cu 3t și cu 35 de KM.} \\ ① 3t \cdot x = 1 \parallel :3 \quad \cancel{3t(15)} \quad 15:3t = \frac{1}{3}$$

$$1178 \cdot x = 3 \rightarrow \text{coste me qunz de} \quad 1178 = -3$$

$$\begin{array}{l} -3x = 27 \quad | \cdot (-1) \\ 3x = -27 \quad | : 3 \Rightarrow x = -9 \end{array}$$

Verfueel 34-49

$$a \geq \hat{a}_j$$

mark

$$157 \mid 157 - (-4)$$

158-3

$$\begin{array}{r}
 37 \\
 99 \\
 \hline
 333 \\
 198 \\
 \hline
 1813
 \end{array}$$

2-83
2

$$\begin{array}{r} 1812 \\ \underline{-107} \\ \hline 2302 \end{array}$$

9167-2252
NO
14

1164
83

197
43
1150

$\mathbb{Z}^m \cup \mathbb{Z}_{(oo)}$

$$\frac{M(U_2)}{M(U_{102})} \left(\frac{193}{197} \right)^{197} = \underline{\underline{--\underline{\underline{?}}}}$$

$$\left| \begin{array}{c} \text{e}^{-t} \left(\begin{array}{c} 1 \\ 1 \\ 1 \end{array} \right) \\ \sin(t) \left(\begin{array}{c} 1 \\ 1 \\ 1 \end{array} \right) \end{array} \right| = \left| \begin{array}{c} 100 - 50 - 100 \\ 343 \\ 197 \\ 197 \\ 107 \end{array} \right|$$

$$193^{194} = \cancel{(-7)^{194}} = (-7)^{194} = -(\cancel{7})^{194} = x$$

$$193 - \frac{1}{2} \times 193 = 193 \times \left(1 - \frac{1}{2}\right) = 193 \times \frac{1}{2} = 96.5$$

$$\text{Soit } x = -1 \text{ et } 197 \text{ ème groupe de 200} \\ 188 = x \cdot (-1)^3 = -1^{200} = (-1)^{50} = 1$$

$$x \cdot (-\frac{3}{3}) = 1 \text{ an } \underline{\text{Zeros}}$$

$$x \cdot 57 = 1 \rightarrow x = \frac{1}{57} \quad (\text{look at})$$

$$\begin{array}{r} 57 \\ \times 93 \\ \hline 171 \\ 513 \\ \hline 1371 \end{array}$$

- 01 - befindt

Răspunsul e $\boxed{93}$.

-12-

Ultima cifră a lui 3 se repetă din $\frac{1}{3}$ în $\frac{1}{3}$.

③ $\boxed{193 \ 197}$ - ult. cifră e $\frac{1}{3}$ (se repetă din 2 în 2).

Numele $x = 193 \ 197$

$$x = 72 \rightarrow \text{e ptz} \rightarrow \boxed{n=0}$$

Restul împărțirii de 25



$$U(\mathbb{Z}_{25}) \quad \widehat{193 \ 197} = \widehat{19}^{197} = \widehat{x}$$

$$\widehat{19}^{25} = 1 \quad \widehat{19} = 1$$

Elementele grupului $0, 1, 2, \dots, 24 \rightarrow 25$ elemente -

$0, 5, 10, 15, 20$ - dim 25 scot 5 \Rightarrow

$$|U(\mathbb{Z}_{25})| = 20 \rightarrow \widehat{19}^{20} = 1 \text{ (Teorema Euler),}$$

$$\widehat{x} \cdot \widehat{19}^3 = \widehat{19}^{200} \cdot (\widehat{19}^{20})^{10} = \widehat{1}^{10} = \widehat{1}$$

$$\widehat{19} = -6$$

$$\widehat{19}^2 = \widehat{36} \mid 1 : 25 \rightarrow \text{rest } 11 = \widehat{11}$$

$$\widehat{19}^3 = \widehat{19}^2 \cdot \widehat{19} = -6 \cdot \widehat{11} = -66 = \widehat{9}$$

$$U(\mathbb{Z}_{25}) \quad \widehat{x} \cdot \widehat{9} = \widehat{1} \mid \cdot \widehat{3} \quad \text{restul } (-16) \text{ în } \mathbb{Z}_{25}$$

$$\widehat{27} \cdot \widehat{x} = \widehat{3}$$

$$\widehat{2x} = \widehat{3} = \widehat{28} \Rightarrow \widehat{x} = \widehat{15} \Rightarrow$$

$$\left\{ \begin{array}{l} x = 25k + 15 \\ x = 722 \end{array} \right.$$

$$\begin{array}{r} 361 \mid 25 \\ 25 \\ \hline 111 \\ 100 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 66 \mid 25 \\ 50 \\ \hline 16 \end{array}$$

Am 15 \rightarrow 1 conditie cu 0...92

$$39 \mid 64, 89$$

$$1002 + 67 \Rightarrow \text{ultimele 2 cifre} = 6 \text{ și } \boxed{64}.$$

Test 1

11

$$(h) U(\mathcal{K}_{101})$$

$$\hat{5}^{100} = 1 \quad 101 \text{ pthm} \quad \text{Möllerens a. d. Fermat}$$

$$\hat{2}^{100} = \hat{3}^{100} = \hat{5}^{100} = 1 \quad \text{Expon. grupp. d. 100}$$

$$\begin{aligned} \hat{5}^{99} \cdot 5 &= 5^{100} \\ \hat{5}^{99} \cdot \hat{5} &= \hat{1} = -100 \Rightarrow \hat{5}^{99} = -\frac{100}{5} = -20 \mathcal{K}_{101}. \quad \uparrow \text{in } \mathcal{K}_{101} \end{aligned}$$

$$\hat{5}^{99} = -20 = 81 (?)$$

$$\hat{8}^{99} + \hat{3}^{98} + \hat{2}^{97} = -20 + \hat{38} + \hat{38} = \hat{83} - 20 = \hat{63}$$

$$(\hat{3}^{98})^2 = \hat{3}^{100} = 1 \mid \hat{1}$$

$$\hat{9} \hat{3}^{98} = \hat{1} \hat{1} = \hat{1} \hat{1} \Rightarrow \hat{3}^{98} = \hat{1} \hat{1} : \frac{1}{2} = \frac{1}{2}$$

$$\hat{2} \cdot \hat{3}^{98} = \hat{2}^{100} = 1 \mid \hat{1} \quad \text{in } \mathcal{K}_{101}$$

$$\frac{13}{103}$$

9 in \mathcal{K}_{101}

$$\begin{matrix} 2^3 \\ 2^3 \\ 103 \end{matrix} \cdot \begin{matrix} 2^9 \\ 2^9 \end{matrix} = 13$$

in \mathcal{K}_{101}

$13 + 101$

$$\hat{3} \cdot \hat{2}^{97} = \hat{13} = \hat{11} \quad \text{in } \mathcal{K}_{101}$$

$$\hat{2}^{97} = \hat{38}$$

$$\text{Résultat} = 63$$

RSA - Exemplarische.

Grup. (6, 1)

E Galois. - $(1810 - 1831)$

$$x^2 + ax + b = 0 \Rightarrow x_{1,2} = \frac{-a \pm \sqrt{a^2 - 4b}}{2}$$

sec. 16 $x^3 + ax^2 + bx + c = 0$

$$x = y + \alpha \quad (\text{o. translation})$$

Tortaglia
Cordone

$$(y + \alpha)^3 + a(y + \alpha)^2 + b(y + \alpha) + c = 0$$

$$\text{Coef. of } x^2 \text{ und } y^2 \text{ este: } 3\alpha + a = 0 \Rightarrow \boxed{\alpha = -\frac{a}{3}}$$

$$x = y + \alpha = y - \frac{\alpha}{3}$$

$$y^3 + py + q = 0$$

$$\text{soit } y = u + v$$

$$0 = u^3 + v^3 + 3u^2v + 3uv^2 + p(u+v) + q$$

$$3uv(u+v)$$

$$0 = u^3 + v^3 + (u+v)(3uv + p) + q$$

$$\boxed{uv = -\frac{p}{3}}$$

$$u^3 + v^3 = -q$$

$$(u^3 - v^3)^2 = (u^3 + v^3)^2 - 4u^3v^3 = q^2 + \frac{4p^3}{27} \Rightarrow$$

$$2u^3v^3$$

$$\left. \begin{array}{l} u^3 - v^3 = \sqrt{q^2 + \frac{4p^3}{27}} \\ u^3 + v^3 = -q \end{array} \right\} \text{ le second} \rightarrow$$

$$u^3 = -\frac{q}{2} + \sqrt{\frac{q^2}{4} + \frac{p^3}{27}}$$

$$u = \sqrt[3]{-\frac{q}{2} + \sqrt{\frac{q^2}{4} + \frac{p^3}{27}}}$$

$$v^3 = -\frac{q}{2} - \sqrt{\frac{q^2}{4} + \frac{p^3}{27}}$$

$$v = \sqrt[3]{-\frac{q}{2} - \sqrt{\frac{q^2}{4} + \frac{p^3}{27}}}$$

$$y_1 = u + v \rightarrow \text{solutions}$$

$$y_2 = uv + u^2v \rightarrow$$

$$y_3 = u^2u + uv^2 \rightarrow$$

$$w = \text{racine de } z = \frac{-1 \pm i\sqrt{3}}{2}$$

d'après $\sqrt{3} = \cos \frac{\pi}{6}$

$$\text{Ex de prod 2 racines } x^2 + ax + b \quad \frac{x_1 + x_2}{2} = \frac{-a + \sqrt{a^2 - 4b}}{2}$$

$$x^k + a_{k-1}x^{k-1} + \dots + a_1x + a_0$$

- 15 -

$k \geq 5$

$a_j \in \mathbb{R}(0)$

\pm

Home $(m, n) = 1 \Rightarrow$ Existence $x \in \{0, 1, \dots, mn-1\}$

such prime numbers

and $\begin{cases} x = m_1 + n_1 \\ x = m_2 + n_2 \end{cases}$

$m_1 \in \{0, 1, \dots, n-1\}$

$n_1 \in \{0, 1, \dots, m-1\}$



122-3



Test 1

Mark

④ Care este restul împărțirii lui $2^{97} + 3^{98} + 5^{99}$ la 101?

$$(2, 101) = 1$$

$$(3, 101) = 1$$

$$(5, 101) = 1$$

$$\varphi(101) = 100 \left(1 - \frac{1}{101}\right) = 100$$

$$\Rightarrow 2^{100} = 3^{100} = 5^{100} \equiv 1$$

$$U(\mathbb{Z}_{101})$$

$$\widehat{2} \cdot \widehat{5}^{-1} = \widehat{102} = 1 \Rightarrow \widehat{2}^{-1} = \widehat{5}$$

$$\widehat{3} \cdot \widehat{3}^{-1} = \widehat{102} = 1 \Rightarrow \widehat{3}^{-1} = \widehat{37}$$

$$\widehat{5} \cdot \widehat{5}^{-1} = \widehat{100} = 1 \Rightarrow (\widehat{5} \cdot \widehat{20})^2 = 1 \Rightarrow$$

$$\Rightarrow \widehat{5} \cdot (\widehat{5} \cdot \widehat{20}^2) = 1 \Rightarrow \widehat{5}^{-1} = \widehat{5} \cdot \widehat{20}^2 = \widehat{2000} = \widehat{81}$$

$$\widehat{2}^{97} + \widehat{3}^{98} + \widehat{5}^{99} = \widehat{2}^{100} (\widehat{2}^{-1})^3 + \widehat{3}^{100} \cdot (\widehat{3}^{-1})^2 + \widehat{5}^{100} \cdot \widehat{5}^{-1} =$$

$$= \widehat{1} \cdot \widehat{51} + \widehat{1} \cdot \widehat{37}^2 + \widehat{1} \cdot \widehat{81} = \widehat{38} + \widehat{35} + \widehat{81} = \widehat{164} = \widehat{63} \pmod{101}$$

$\Rightarrow \boxed{63}$

① Găsește cel mai mic număr de tip 5423...151 care este $\widehat{37} \cdot x = 1$ în $U(\mathbb{Z}_{101})$.

$$\begin{aligned} \widehat{37} \cdot x &= 1 & U(\mathbb{Z}_{151}) & \begin{aligned} a &= 37 \\ b &= 151 \end{aligned} \\ (\widehat{37}, 151) &= 1 \end{aligned}$$

$$151 = 37 \cdot \boxed{4} + 3$$

$$37 = 3 \cdot \boxed{12} + 1$$

$$3 = 1 \cdot 3$$

$$\frac{B}{A} = 4 + \frac{1}{12} = \frac{49}{12} \text{ modulul lui } 12$$

$$\widehat{B} \cdot A - \widehat{A} \cdot b = (-1)^3 \Rightarrow -\widehat{49} \cdot \widehat{37} = -1$$

$$\widehat{B} \cdot a = 1 \cdot 1 \Rightarrow \widehat{37} \cdot \widehat{37} = 1 \Rightarrow \widehat{37}^{-1} = \widehat{37} = \widehat{x} \Rightarrow \boxed{37}$$

5
⑤ Decrypted XCAE
23 2 0 2
X C A C ↓ +6
D G I
38 68

2

Ans ZECB

2
② Ce sunt ultimele 2 cifre ale lui $\frac{193^{197}}{100}$
 $n=100 \quad g(n)=100 : (1-\frac{1}{2})(1-\frac{1}{5})=40 \Rightarrow$ $U(K_{100})$

3
 $\Rightarrow \widehat{193}^{40} = 1 \Rightarrow \widehat{193}^{5 \cdot 80} = 1 \Rightarrow \widehat{193}^{200} = 1 \Rightarrow \widehat{193}^{197} = (\widehat{193}^{-1})^3$
 $\widehat{193} = \widehat{93} \text{ sau } b=100$
 $100 = 93 \boxed{1} + 7$
 $93 = 7 \cdot \widehat{13} + 2$
 $7 = 2 \cdot \widehat{3} + 1$
 $2 = 1 \cdot 2$
 $\Rightarrow \widehat{93} \cdot (\widehat{13}) = \widehat{1} \Rightarrow \widehat{93}^{-1} = \widehat{57} \Rightarrow (\widehat{193}^{-1})^3 = \widehat{57}^3 = \widehat{93} \Rightarrow \widehat{\underline{\underline{93}}}$

4
③ Ce sunt ultimele 2 cifre ale lui $\frac{195^{197}}{100}$
 $\widehat{195}^{197} = \widehat{95}^{197} = (\widehat{6})^{197} = -\widehat{6}^{197} \text{ mod } U(100)$

$$\begin{aligned} 6^1 &= 6 \\ 6^2 &= 36 \\ 6^3 &\sim 16 \\ 6^4 &\sim 96 \\ 6^5 &\sim 76 \\ 6^6 &\sim 56 \\ 6^7 &\sim 36 \end{aligned}$$

Ultimile 2 cifre ale lui 6^n se repetă din 5 în 5 (exceptie foind 64) \Rightarrow

$$\Rightarrow \widehat{6}^{197} = \widehat{6}^{195+2} = \widehat{6}^2 = \widehat{36}$$

$$-\widehat{6}^{197} = -\widehat{36} = \widehat{64} \Rightarrow \widehat{\underline{\underline{64}}} \text{ noptunis}$$