Table 149: Square-Perimeters_4

| How many MPS ($z^2$) does it take to fill a SQUARE with 4z=P perimeters? & $(z^2 + z)/2 = PN = xz = (MPS+Mp)/2$ | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $p$ | Mersenne Primes $= 2^p-1 = (2^{n+1}) -1 = z$ | $2^{p-1} = 2^n = x$ | x-1 =y | ∑•x/2 =PN =xz | Perimeter (P)=4PN/x =4z=PN/N =P | number of Perimeters =x/4 =N | Mersenne Prime Square (MPS) $=z^2$ | # of MPS (nP=PN) $=x^2/16=\#=N^2$ | Equals Exp. Power of 2 | PN/4=s =xz/4 | Square Area, $s^2=N^2z^2=(PN/4)^2=A_{MMPS}$ | 4PN+2x $=PN_{next}$ |
| 2 | $2^2-1=4-1=3$ | $2^1=2$ | 2-1=1 | 6 •1=6 | 4 • 3=12 | 2 ÷ 4 = 0.5 | $3^2 = 9$ | $0.5^2 = 0.25$ | | 6 ÷4=1.5 | $0.25 \cdot 3^2=9$ | 4(6)+2(2)=28 |
| 3 | 7 | 4 | 3 | 28 | 28 | 1 | 49 | 1 | $2^0$ | 7 | 49 | 120 |
| 4 | 15 | 8 | 7 | 120 | 60 | 2 | 225 | 4 | $2^2$ | 30 | 900 | 496 |
| 5 | 31 | 16 | 15 | 496 | 124 | 4 | 961 | 16 | $2^4$ | 124 | 15376 | 2016 |
| 6 | 63 | 32 | 31 | 2016 | 252 | 8 | 3969 | 64 | $2^6$ | 504 | 254016 | 8128 |
| 7 | 127 | 64 | 63 | 8128 | 508 | 16 | 16129 | 256 | $2^8$ | 2032 | 4129024 | 32640 |
| 8 | 255 | 128 | 127 | 32640 | 1020 | 32 | 65025 | 1024 | $2^{10}$ | 8160 | 66585600 | 130816 |
| 9 | 511 | 256 | 255 | 130816 | 2044 | 64 | 261121 | 4096 | $2^{12}$ | 32704 | 1069551616 | 523776 |
| 10 | 1023 | 512 | 511 | 523776 | 4092 | 128 | 1046529 | 16384 | $2^{14}$ | 130944 | 17146331136 | 2096128 |
| 11 | 2047 | 1024 | 1023 | 2096128 | 8188 | 256 | 4190209 | 65536 | $2^{16}$ | 524032 | 274609537024 | 8386560 |
| 12 | 4095 | 2048 | 2047 | 8386560 | 16380 | 512 | 16769025 | 262144 | $2^{18}$ | 2096640 | 4395899289600 | 33550336 |
| 13 | 8191 | 4096 | 4095 | 33550336 | 32764 | 1024 | 67092481 | 1048576 | $2^{20}$ | 8387584 | 70351565357056 | 134209536 |
| 14 | 16383 | 8192 | 8191 | 134209536 | 65532 | 2048 | 268402689 | 4194304 | $2^{22}$ | 33552384 | 1125762472083460 | 536854528 |
| 15 | 32767 | 16384 | 16383 | 536854528 | 131068 | 4096 | 1073676289 | 16777216 | $2^{24}$ | 134213632 | 18013299014631400 | 2147450880 |
| 16 | 65535 | 32768 | 32767 | 2147450880 | 262140 | 8192 | 4294836225 | 67108864 | $2^{26}$ | 536862720 | 288221580125798000 | 8589869056 |
| 17 | 131071 | 65536 | 65535 | 8589869056 | 524284 | 16384 | 17179607041 | 268435456 | $2^{28}$ | 2147467264 | 4611615649951650000 | 34359607296 |
| 18 | 262143 | 131072 | 131071 | 34359607296 | 1048572 | 32768 | 68718952449 | 1073741824 | $2^{30}$ | 8589901824 | 7378641334595850000 | 137438691328 |
| 19 | 524287 | 262144 | 262143 | 137438691328 | 2097148 | 65536 | 274876858369 | 4294967296 | $2^{32}$ | 34359672832 | 1180587117122080000000 | 549755289600 |
| 20 | 1048575 | 524288 | 524287 | 549755289600 | 4194300 | 131072 | 1099509530625 | 17179869184 | $2^{34}$ | 137438822400 | 1888942990269870000000 | 2199022206976 |
| 21 | 2097151 | 1048576 | 1048575 | 2199022206976 | 8388604 | 262144 | 4398042316801 | 68719476736 | $2^{36}$ | 549755551744 | 3022311666733500000000000 | 8796090925056 |
| 22 | 4194303 | 2097152 | 2097151 | 8796090925056 | 16777212 | 524288 | 17592177655809 | 274877906944 | $2^{38}$ | 2199022731264 | 4835700972615780000000000 | 35184367894528 |
| 23 | 8388607 | 4194304 | 4194303 | 35184367894528 | 33554428 | 1048576 | 70368727400449 | 1099511627776 | $2^{40}$ | 8796091973632 | 7737123400859330000000000 | 140737479966720 |
| 24 | 16777215 | 8388608 | 8388607 | 140737479966720 | 67108860 | 2097152 | 28147494315622 | 4398046511104 | $2^{42}$ | 35184369991680 | 1237939891711430000000000000 | 562949936644096 |
| 25 | 33554431 | 16777216 | 16777215 | 562949936644096 | 134217724 | 4194304 | 1125899839733761 | 17592186044416 | $2^{44}$ | 140737484161024 | 1980703944797450000000000000 | 2251799780130816 |
| 26 | 67108863 | 33554432 | 33554431 | 2251799780130816 | 268435452 | 8388608 | 4503599493152769 | 70368744177664 | $2^{46}$ | 562949945032704 | 3169126406123240000000000000000 | 9007199187632128 |
| 27 | 134217727 | 67108864 | 67108863 | 9007199187632128 | 536870908 | 16777216 | 18014398241046529 | 281474976710656 | $2^{48}$ | 2251799796908030 | 5070602325355050000000000000000 | 36028796884746240 |
| 28 | 268435455 | 134217728 | 134217727 | 36028796884746240 | 1073741820 | 33554432 | 72057593501057025 | 1125899906842624 | $2^{50}$ | 9007199221186560 | 8112963781014380000000000000000 | 144115187807420416 |
| 29 | 536870911 | 268435456 | 268435455 | 144115187807420416 | 2147483644 | 67108864 | 288230375077969921 | 4503599627370496 | $2^{52}$ | 36028796951855100 | 1298074209798000000000000000000000 | 576460751766552576 |
| 30 | 1073741823 | 536870912 | 536870911 | 576460751766552576 | 4294967292 | 134217728 | 1152921502459363329 | 18014398509481984 | $2^{54}$ | 144115187941638000 | 2076918739545370000000000000000000 | 2305843008139952128 |
| 31 | 2147483647 | 1073741824 | 1073741823 | 2305843008139952128 | 8589934588 | 268435456 | 4611686014132420609 | 72057594037927936 | $2^{56}$ | 576460752034988000 | 3323069986367440000000000000000000000 | 9223372034707292160 |
| 32 | 4294967295 | 2147483648 | 2147483647 | 9223372034707292160 | 17179869180 | 536870912 | 18446744065119617025 | 288230376151711744 | $2^{58}$ | 2305843008676820000 | 5316911980663780000000000000000000000 | 36893488143124135936 |
| 33 | 8589934591 | 4294967296 | 4294967295 | 36893488143124135936 | 34359738364 | 1073741824 | 73786976277658337281 | 1152921504606846976 | $2^{60}$ | 9223372035781030000 | 8507059171042760000000000000000000000 | 147573952581086478336 |
| 34 | 17179869183 | 8589934592 | 8589934591 | 147573952581086478336 | 68719476732 | 2147483648 | 295147905144993087489 | 4611686018427387904 | $2^{62}$ | 36893488145271600000 | 1361129467525300000000000000000000000 | 590295810341525782528 |
| 35 | 34359738367 | 17179869184 | 17179869183 | 590295810341525782528 | 137438953468 | 4294967296 | 1180591620648691826689 | 18446744073709551616 | $2^{64}$ | 147573952585381000000 | 2177807148167240000000000000000000000 | 2361183241400462868480 |
| 36 | 68719476735 | 34359738368 | 34359738367 | 2361183241400462868480 | 274877906940 | 8589934592 | 4722366482732206260225 | 73786976294838206464 | $2^{66}$ | 590295810350116000000 | 3484491437169000000000000000000000000 | 9444732965670570950656 |
| 37 | 137438953471 | 68719476736 | 68719476735 | 9444732965670570950656 | 549755813884 | 17179869184 | 18889465931203702947841 | 295147905179352825856 | $2^{68}$ | 2361183241417640000000 | 5575186299551530000000000000000000000 | 37778931862819722756096 |
| 38 | 274877906943 | 137438953472 | 137438953471 | 37778931862819722756096 | 1099511627772 | 34359738368 | 755578637253645676052 49 | 1180591620717411303424 | $2^{70}$ | 94447329657049300000000 | 8920298079347350000000000000000000000 | 1511157274515537689313 28 |
| 39 | 549755813887 | 274877906944 | 274877906943 | 1511157274515537689313 28 | 2199023255548 | 68719476736 | 3022314549025577820487 69 | 4722366482869645213696 | $2^{72}$ | 37778931862888400000000 | 1427247692700770000000000000000000000000000 | 6044629098067648315 39200 |
| 40 | 1099511627775 | 549755813888 | 549755813887 | 6044629098067648315 39200 | 4398046511100 | 137438953472 | 1208925819612430151450625 | 1888946593147858054784 | $2^{74}$ | 15111572745169100000000 | 2283596308325380000000000000000000000000000 | 2417851639228158837784576 |
| 41 | 2199023255551 | 1099511627776 | 1099511627775 | 2417851639228158837784576 | 8796093022204 | 274877906944 | 4835703278454118652313601 | 7555786372591432341913 6 | $2^{76}$ | 60446290980704000000000 | 3653754093323930000000000000000000000000000 | 9671406556914834374393856 |
| 42 | 4398046511103 | 2199023255552 | 2199023255551 | 9671406556914834374393856 | 17592186044412 | 549755813888 | 1934281311382527070227660 9 | 3022314549036572936765 44 | $2^{78}$ | 2417851639228710000000000 | 5846006549320950000000000000000000000000000 | 3868562622766373554408 6528 |
| 43 | 8796093022207 | 4398046511104 | 4398046511103 | 38685626227663735544086528 | 35184372088828 | 1099511627776 | 7737125245531867499515084 9 | 1208925819614629174706176 | $2^{80}$ | 9671406556915930000000000 | 9353610478915650000000000000000000000000000 | 1547425049106637382693683 20 |
| 44 | 17592186044415 | 8796093022208 | 8796093022207 | 15474250491066373826936832 0 | 70368744177664 | 2199023255552 | 3094850098213098843526922 25 | 4835703278458516698824704 | $2^{82}$ | 38685626227665900000000000 | 1496576766266700000000000000000000000000000 | 6189700196426725452635176 96 |
| 45 | 35184372088831 | 17592186044416 | 17592186044415 | 6189700196426725452635176 96 | 14073748835532 | 4398046511104 | 1237940039285309906154946561 | 1934281311383406679529881 6 | $2^{84}$ | 15474250491066800000000000000 | 2394524282602820000000000000000000000000000 | 2475880078570725365426159616 |
| 46 | 70368744177663 | 35184372088832 | 35184372088831 | 24758800785707253654261596 16 | 28147497671065 | 8796093022208 | 4951760157141380362108141569 | 7737125245533626718119526 4 | $2^{86}$ | 6189700196426810000000000000 | 3831238852164610000000000000000000000000000 | 9903520314282971830448816128 |
| 47 | 140737488355327 | 70368744177664 | 70368744177663 | 9903520314282971830448816128 | 56294995342136 | 17592186044416 | 1980704062856580292340927692 9 | 3094850098213450687247810 56 | $2^{88}$ | 24758800785707400000000000000 | 6129982163463470000000000000000000000000000 | 3961408125713202805928361984 0 |
| 48 | 281474976710655 | 140737488355328 | 140737488355327 | 39614081257132028059283619840 | 11258999068426 | 35184372088832 | 7922816251426377464359052902 5 | 1237940039285380274899124224 | $2^{90}$ | 99035203142830100000000000000 | 9807971461541620000000000000000000000000000 | 1584563250285283937121111190016 |
| 49 | 562949953421311 | 281474976710656 | 281474976710655 | 1584563250285283937121111190016 | 2251799813685244 | 70368744177664 | 3169126500570562244742689587 21 | 4951760157141521099596496896 | $2^{92}$ | 39614081257132100000000000000 | 1569275433846660000000000000000000000000000 | 6338253001141141377983981813 76 |
| 50 | 11258999068426 23 | 562949953421312 | 562949953421311 | 6338253001141141377983981813 76 | 4503599627370492 | 140737488355328 | 1267650600228227149696885920129 | 1980704062856608439838598758 4 | $2^{94}$ | 15845632502852900000000000000 | 2510840694154670000000000000000000000000000 | 2535301200456460000000000000000 |
| $p$ | Mersenne Primes $= 2^p-1 = (2^{n+1}) -1 = z$ | $2^{p-1} = 2^n = x$ | x-1 =y | ∑•x/2 =PN =xz | Perimeter (P)=4PN/x =4z =P | number of Perimeters =x/4 =N | Mersenne Prime Square (MPS) $=z^2$ | # of MPS (nP=PN) $=x^2/16=\#=N^2$ | Equals Exp. Power of 2 | PN/4=s =xz/4 | Square Area, $s^2=N^2z^2=(PN/4)^2=A_{MMPS}$ | 4PN+2x $=PN_{next}$ |

Table 149: Perimeters (P): P=4PN/x=4xz/x=4z PN=xP/4=#P/N where # (of MPS)=x/4•N (number of P)=xN/4=$n^2$ x=4#/N N=4#/x=PN/P z=P/4, and remember x=(z+1)/2 x_next=z+1 y_next=z.
Ex: z=31 4z=4•31=124=P x=(z+1)/2=16 PN=xz=16•31=496 N=PN/P=496/124=4 #=xN/4=$N^2$=$4^2$ =16. Knowing x, then $x^2/4^2$ =#. Note that $(z^2 + z)/2 = PN = xz = (MPS+Mp)/2$.
The "NEXT" PN container is simply 4PN+2x=$PN_{next}$. See Tables 146,147,148.

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