

Table 84: List of the 51 Mersenne Prime Numbers, x, Perfect Numbers and the # of Digits

| List of the 51 Mersenne Prime Numbers, x, Perfect Numbers and # of Digits |            |  |                          |                     |   |                          |                             |                 |             |                            |                  |             |  |                 |          |
|---|------------|--|--------------------------|---------------------|---|--------------------------|-----------------------------|-----------------|-------------|----------------------------|------------------|-------------|--|-----------------|----------|
| #   | $p$        | Mersenne Primes<br>$= 2^p - 1$<br>$= (2^{n+1}) - 1$<br>$= z$ | Mersenne Prime digits, # | $2^{p-1} = 2^n = x$ | Perfect Number<br>$= xz$                  | Perfect Number digits, # | $\sum z\# + xz\#$ of digits | $\Delta$ from p | % of p      | $\sum z\# + z\#$ of digits | $\Delta$ from PN | % of PN     | $\sum x\# + y\# + z\# \approx 3z$ digits | $\Delta$ from p | % of p   |
| 1   | 2          | $2^2-1$  | 1                        | $2^1$               | $2^1 \cdot (2^2-1)$                       | 1                        | 2                           | 0               | 100.000000% | 2                          | 1                | 200.000000% | 3  | 1               | 150.000% |
| 2   | 3          | $2^3-1$  | 1                        | $2^2$               | $2^2 \cdot (2^3-1)$                       | 2                        | 3                           | 0               | 100.000000% | 2                          | 0                | 100.000000% | 3  | 0               | 100.000% |
| 3   | 5          | $2^5-1$  | 2                        | $2^4$               | $2^4 \cdot (2^5-1)$                       | 3                        | 5                           | 0               | 100.000000% | 4                          | 1                | 133.333333% | 6  | 1               | 120.000% |
| 4   | 7          | $2^7-1$  | 3                        | $2^6$               | $2^6 \cdot (2^7-1)$                       | 4                        | 7                           | 0               | 100.000000% | 6                          | 2                | 150.000000% | 9  | 2               | 128.571% |
| 5   | 13         | $2^{13}-1$   | 4                        | $2^{12}$            | $2^{12} \cdot (2^{13}-1)$                 | 8                        | 12                          | 1               | 92.307692%  | 8                          | 0                | 100.000000% | 12                                       | -1              | 92.308%  |
| 6   | 17         | $2^{17}-1$   | 6                        | $2^{16}$            | $2^{16} \cdot (2^{17}-1)$                 | 10                       | 16                          | 1               | 94.117647%  | 12                         | 2                | 120.000000% | 18                                       | 1               | 105.882% |
| 7   | 19         | $2^{19}-1$   | 6                        | $2^{18}$            | $2^{18} \cdot (2^{19}-1)$                 | 12                       | 18                          | 1               | 94.736842%  | 12                         | 0                | 100.000000% | 18                                       | -1              | 94.737%  |
| 8   | 31         | $2^{31}-1$   | 10                       | $2^{30}$            | $2^{30} \cdot (2^{31}-1)$                 | 19                       | 29                          | 2               | 93.548387%  | 20                         | 1                | 105.263158% | 30                                       | -1              | 96.774%  |
| 9   | 61         | $2^{61}-1$   | 19                       | $2^{60}$            | $2^{60} \cdot (2^{61}-1)$                 | 37                       | 56                          | 5               | 91.803279%  | 38                         | 1                | 102.702703% | 57                                       | -4              | 93.443%  |
| 10  | 89         | $2^{89}-1$   | 27                       | $2^{88}$            | $2^{88} \cdot (2^{89}-1)$                 | 54                       | 81                          | 8               | 91.011236%  | 54                         | 0                | 100.000000% | 81                                       | -8              | 91.011%  |
| 11  | 107        | $2^{107}-1$  | 33                       | $2^{106}$           | $2^{106} \cdot (2^{107}-1)$               | 65                       | 98                          | 9               | 91.588785%  | 66                         | 1                | 101.538462% | 99                                       | -8              | 92.523%  |
| 12  | 127        | $2^{127}-1$  | 39                       | $2^{126}$           | $2^{126} \cdot (2^{127}-1)$               | 77                       | 116                         | 11              | 91.338583%  | 78                         | 1                | 101.298701% | 117                                      | -10             | 92.126%  |
| 13  | 521        | $2^{521}-1$  | 157                      | $2^{520}$           | $2^{520} \cdot (2^{521}-1)$               | 314                      | 471                         | 50              | 90.403071%  | 314                        | 0                | 100.000000% | 471                                      | -50             | 90.403%  |
| 14  | 607        | $2^{607}-1$  | 183                      | $2^{606}$           | $2^{606} \cdot (2^{607}-1)$               | 366                      | 549                         | 58              | 90.444811%  | 366                        | 0                | 100.000000% | 549                                      | -58             | 90.445%  |
| 15  | 1,279      | $2^{1,279}-1$  | 386                      | $2^{1,278}$         | $2^{1,278} \cdot (2^{1,279}-1)$           | 770                      | 1156                        | 123             | 90.383112%  | 772                        | 2                | 100.259740% | 1158                                     | -121            | 90.539%  |
| 16  | 2,203      | $2^{2,203}-1$  | 664                      | $2^{2,202}$         | $2^{2,202} \cdot (2^{2,203}-1)$           | 1,327                    | 1991                        | 212             | 90.376759%  | 1328                       | 1                | 100.075358% | 1992                                     | -211            | 90.422%  |
| 17  | 2,281      | $2^{2,281}-1$  | 687                      | $2^{2,280}$         | $2^{2,280} \cdot (2^{2,281}-1)$           | 1,373                    | 2060                        | 221             | 90.311267%  | 1374                       | 1                | 100.072833% | 2061                                     | -220            | 90.355%  |
| 18  | 3,217      | $2^{3,217}-1$  | 969                      | $2^{3,216}$         | $2^{3,216} \cdot (2^{3,217}-1)$           | 1,937                    | 2906                        | 311             | 90.332608%  | 1938                       | 1                | 100.051626% | 2907                                     | -310            | 90.364%  |
| 19  | 4,253      | $2^{4,253}-1$  | 1,281                    | $2^{4,252}$         | $2^{4,252} \cdot (2^{4,253}-1)$           | 2,561                    | 3,842                       | 411             | 90.336233%  | 2562                       | 1                | 100.039047% | 3,843                                    | -410            | 90.360%  |
| 20  | 4,423      | $2^{4,423}-1$  | 1,332                    | $2^{4,422}$         | $2^{4,422} \cdot (2^{4,423}-1)$           | 2,663                    | 3,995                       | 428             | 90.323310%  | 2664                       | 1                | 100.037552% | 3,996                                    | -427            | 90.346%  |
| 21  | 9,689      | $2^{9,689}-1$  | 2,917                    | $2^{9,688}$         | $2^{9,688} \cdot (2^{9,689}-1)$           | 5,834                    | 8,751                       | 938             | 90.318918%  | 5834                       | 0                | 100.000000% | 8,751                                    | -938            | 90.319%  |
| 22  | 9,941      | $2^{9,941}-1$  | 2,993                    | $2^{9,940}$         | $2^{9,940} \cdot (2^{9,941}-1)$           | 5,985                    | 8,978                       | 963             | 90.312846%  | 5986                       | 1                | 100.016708% | 8,979                                    | -962            | 90.323%  |
| 23  | 11,213     | $2^{11,213}-1$   | 3,376                    | $2^{11,212}$        | $2^{11,212} \cdot (2^{11,213}-1)$         | 6,751                    | 10,127                      | 1,086           | 90.314813%  | 6752                       | 1                | 100.014813% | 10,128                                   | -1,085          | 90.324%  |
| 24  | 19,937     | $2^{19,937}-1$   | 6,002                    | $2^{19,936}$        | $2^{19,936} \cdot (2^{19,937}-1)$         | 12,003                   | 18,005                      | 1,932           | 90.309475%  | 12004                      | 1                | 100.008331% | 18,006                                   | -1,931          | 90.314%  |
| 25  | 21,701     | $2^{21,701}-1$   | 6,533                    | $2^{21,700}$        | $2^{21,700} \cdot (2^{21,701}-1)$         | 13,066                   | 19,599                      | 2,102           | 90.313810%  | 13066                      | 0                | 100.000000% | 19,599                                   | -2,102          | 90.314%  |
| 26  | 23,209     | $2^{23,209}-1$   | 6,987                    | $2^{23,208}$        | $2^{23,208} \cdot (2^{23,209}-1)$         | 13,973                   | 20,960                      | 2,249           | 90.309794%  | 13974                      | 1                | 100.007157% | 20,961                                   | -2,248          | 90.314%  |
| 27  | 44,497     | $2^{44,497}-1$   | 13,395                   | $2^{44,496}$        | $2^{44,496} \cdot (2^{44,497}-1)$         | 26,790                   | 40,185                      | 4,312           | 90.309459%  | 26790                      | 0                | 100.000000% | 40,185                                   | -4,312          | 90.309%  |
| 28  | 86,243     | $2^{86,243}-1$   | 25,962                   | $2^{86,242}$        | $2^{86,242} \cdot (2^{86,243}-1)$         | 51,924                   | 77,886                      | 8,357           | 90.309938%  | 51924                      | 0                | 100.000000% | 77,886                                   | -8,357          | 90.310%  |
| 29  | 110,503    | $2^{110,503}-1$  | 33,265                   | $2^{110,502}$       | $2^{110,502} \cdot (2^{110,503}-1)$       | 66,530                   | 99,795                      | 10,708          | 90.309765%  | 66530                      | 0                | 100.000000% | 99,795                                   | -10,708         | 90.310%  |
| 30  | 132,049    | $2^{132,049}-1$  | 39,751                   | $2^{132,048}$       | $2^{132,048} \cdot (2^{132,049}-1)$       | 79,502                   | 119,253                     | 12,796          | 90.309658%  | 79502                      | 0                | 100.000000% | 119,253                                  | -12,796         | 90.310%  |
| 31  | 216,091    | $2^{216,091}-1$  | 65,050                   | $2^{216,090}$       | $2^{216,090} \cdot (2^{216,091}-1)$       | 130,100                  | 195,150                     | 20,941          | 90.309175%  | 130100                     | 0                | 100.000000% | 195,150                                  | -20,941         | 90.309%  |
| 32  | 756,839    | $2^{756,839}-1$  | 227,832                  | $2^{756,838}$       | $2^{756,838} \cdot (2^{756,839}-1)$       | 455,663                  | 683,495                     | 73,344          | 90.309167%  | 455664                     | 1                | 100.000219% | 683,496                                  | -73,343         | 90.309%  |
| 33  | 859,433    | $2^{859,433}-1$  | 258,716                  | $2^{859,432}$       | $2^{859,432} \cdot (2^{859,433}-1)$       | 517,430                  | 776,146                     | 83,287          | 90.309076%  | 517432                     | 2                | 100.000387% | 776,148                                  | -83,285         | 90.309%  |
| 34  | 1,257,787  | $2^{1,257,787}-1$  | 378,632                  | $2^{1,257,786}$     | $2^{1,257,786} \cdot (2^{1,257,787}-1)$   | 757,263                  | 1,135,895                   | 121,892         | 90.309011%  | 757264                     | 1                | 100.000132% | 1,135,896                                | -121,891        | 90.309%  |
| 35  | 1,398,269  | $2^{1,398,269}-1$  | 420,921                  | $2^{1,398,268}$     | $2^{1,398,268} \cdot (2^{1,398,269}-1)$   | 841,842                  | 1,262,763                   | 135,506         | 90.309018%  | 841842                     | 0                | 100.000000% | 1,262,763                                | -135,506        | 90.309%  |
| 36  | 2,976,221  | $2^{2,976,221}-1$  | 895,932                  | $2^{2,976,220}$     | $2^{2,976,220} \cdot (2^{2,976,221}-1)$   | 1,791,864                | 2,687,796                   | 288,425         | 90.309019%  | 1791864                    | 0                | 100.000000% | 2,687,796                                | -288,425        | 90.309%  |
| 37  | 3,021,377  | $2^{3,021,377}-1$  | 909,526                  | $2^{3,021,376}$     | $2^{3,021,376} \cdot (2^{3,021,377}-1)$   | 1,819,050                | 2,728,576                   | 292,801         | 90.309021%  | 1819052                    | 2                | 100.000110% | 2,728,578                                | -292,799        | 90.309%  |
| 38  | 6,972,593  | $2^{6,972,593}-1$  | 2,098,960                | $2^{6,972,592}$     | $2^{6,972,592} \cdot (2^{6,972,593}-1)$   | 4,197,919                | 6,296,879                   | 675,714         | 90.309000%  | 4197920                    | 1                | 100.000024% | 6,296,880                                | -675,713        | 90.309%  |
| 39  | 13,466,917 | $2^{13,466,917}-1$   | 4,053,946                | $2^{13,466,916}$    | $2^{13,466,916} \cdot (2^{13,466,917}-1)$ | 8,107,892                | 12,161,838                  | 1,305,079       | 90.308999%  | 8107892                    | 0                | 100.000000% | 12,161,838                               | -1,305,079      | 90.309%  |
| 40  | 20,996,011 | $2^{20,996,011}-1$   | 6,320,430                | $2^{20,996,010}$    | $2^{20,996,010} \cdot (2^{20,996,011}-1)$ | 12,640,858               | 18,961,288                  | 2,034,723       | 90.309002%  | 12640860                   | 2                | 100.000016% | 18,961,290                               | -2,034,721      | 90.309%  |
| 41  | 24,036,583 | $2^{24,036,583}-1$   | 7,235,733                | $2^{24,036,582}$    | $2^{24,036,582} \cdot (2^{24,036,583}-1)$ | 14,471,465               | 21,707,198                  | 2,329,385       | 90.309001%  | 14471466                   | 1                | 100.000007% | 21,707,199                               | -2,329,384      | 90.309%  |
| 42  | 25,964,951 | $2^{25,964,951}-1$   | 7,816,230                | $2^{25,964,950}$    | $2^{25,964,950} \cdot (2^{25,964,951}-1)$ | 15,632,458               | 23,448,688                  | 2,516,263       | 90.309002%  | 15632460                   | 2                | 100.000013% | 23,448,690                               | -2,516,261      | 90.309%  |
| 43  | 30,402,457 | $2^{30,402,457}-1$   | 9,152,052                | $2^{30,402,456}$    | $2^{30,402,456} \cdot (2^{30,402,457}-1)$ | 18,304,103               | 27,456,155                  | 2,946,302       | 90.309000%  | 18304104                   | 1                | 100.000005% | 27,456,156                               | -2,946,301      | 90.309%  |
| 44  | 32,582,657 | $2^{32,582,657}-1$   | 9,808,358                | $2^{32,582,656}$    | $2^{32,582,656} \cdot (2^{32,582,657}-1)$ | 19,616,714               | 29,425,072                  | 3,157,585       | 90.309001%  | 19616716                   | 2                | 100.000010% | 29,425,074                               | -3,157,583      | 90.309%  |
| 45  | 37,156,667 | $2^{37,156,667}-1$   | 11,185,272               | $2^{37,156,666}$    | $2^{37,156,666} \cdot (2^{37,156,667}-1)$ | 22,370,543               | 33,555,815                  | 3,600,852       | 90.309002%  | 22370544                   | 1                | 100.000004% | 33,555,816                               | -3,600,851      | 90.309%  |
| 46  | 42,643,801 | $2^{42,643,801}-1$   | 12,837,064               | $2^{42,643,800}$    | $2^{42,643,800} \cdot (2^{42,643,801}-1)$ | 25,674,127               | 38,511,191                  | 4,132,610       | 90.309002%  | 25674128                   | 1                | 100.000004% | 38,511,192                               | -4,132,609      | 90.309%  |
| 47  | 43,112,609 | $2^{43,112,609}-1$   | 12,978,189               | $2^{43,112,608}$    | $2^{43,112,608} \cdot (2^{43,112,609}-1)$ | 25,956,377               | 38,934,566                  | 4,178,043       | 90.309000%  | 25956378                   | 1                | 100.000004% | 38,934,567                               | -4,178,042      | 90.309%  |
| 48  | 57,885,161 | $2^{57,885,161}-1$   | 17,425,170               | $2^{57,885,160}$    | $2^{57,885,160} \cdot (2^{57,885,161}-1)$ | 34,850,340               | 52,275,510                  | 5,609,651       | 90.309000%  | 34850340                   | 0                | 100.000000% | 52,275,510                               | -5,609,651      | 90.309%  |
| 49*   | 74,207,281 | $2^{74,207,281}-1$   | 22,338,618               | $2^{74,207,280}$    | $2^{74,207,280} \cdot (2^{74,207,281}-1)$ | 44,677,235               | 67,015,853                  | 7,191,428       | 90.308999%  | 44677236                   | 1                | 100.000002% | 67,015,854                               | -7,191,427      | 90.309%  |
| 50*   | 77,232,917 | $2^{77,232,917}-1$   | 23,249,425               | $2^{77,232,916}$    | $2^{77,232,916} \cdot (2^{77,232,917}-1)$ | 46,498,850               | 69,748,275                  | 7,484,642       | 90.309000%  | 46498850                   | 0                | 100.000000% | 69,748,275                               | -7,484,642      | 90.309%  |
| 51*   | 82,589,933 | $2^{82,589,933}-1$   | 24,862,048               | $2^{82,589,932}$    | $2^{82,589,932} \cdot (2^{82,589,933}-1)$ | 49,724,095               | 74,586,143                  | 8,003,790       | 90.309000%  | 49724096                   | 1                | 100.000002% | 74,586,144                               | -8,003,789      | 90.309%  |

Note: As  $z = x + y$ ,  $y = x - 1 = (z - 1)/2$  and  $x = (z + 1)/2$ , the # of digits for "x" & "y" is typically  $\approx$  to those of "z." The  $\sum$  of z + z digits approximates that of the PN. The  $\sum$  of x+y+z # of digits  $\approx 3z \approx 90\%$ . Remember:  $p = n + 1$ . If you know  $2^n$  you know x, y, z, p,  $z^2 + \dots$

Reference: <https://www.mersenne.org/primes/> \* Provisional ranking. [https://en.wikipedia.org/wiki/List\\_of\\_Mersenne\\_primes\\_and\\_perfect\\_numbers](https://en.wikipedia.org/wiki/List_of_Mersenne_primes_and_perfect_numbers)

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