

Table 104: PN NEW Calculations with "p" and "x"

Perfect Numbers (PN): NEW Calculations with "p" and "x"								
#	p	z=Mp, digits	z=Mp, value	xz=PN	xz=PN, value	*2(2 <sup>2p-2</sup> )-2 <sup>p-1</sup> =PN	*(4 <sup>p/2</sup> )-2 <sup>p-1</sup> = PN	*2x <sup>2</sup> -x = PN
1	2	1	3	2 <sup>1</sup> · (2 <sup>2-1</sup> )	6	2 × 2 <sup>2</sup> - 2 <sup>1</sup> = 6	4 <sup>2</sup> / 2 - 2 <sup>1</sup> = 6	2 × 2 <sup>2</sup> - 2 = 6
2	3	1	7	2 <sup>2</sup> · (2 <sup>3-1</sup> )	28	2 × 2 <sup>4</sup> - 2 <sup>2</sup> = 28	4 <sup>3</sup> / 2 - 2 <sup>2</sup> = 28	2 × 4 <sup>2</sup> - 4 = 28
3	5	2	31	2 <sup>4</sup> · (2 <sup>5-1</sup> )	496	2 × 2 <sup>8</sup> - 2 <sup>4</sup> = 496	4 <sup>5</sup> / 2 - 2 <sup>4</sup> = 496	2 × 16 <sup>2</sup> - 16 = 496
4	7	3	127	2 <sup>6</sup> · (2 <sup>7-1</sup> )	8128	2 × 2 <sup>12</sup> - 2 <sup>6</sup> = 8128	4 <sup>7</sup> / 2 - 2 <sup>6</sup> = 8128	2 × 64 <sup>2</sup> - 64 = 8128
5	13	4	8191	2 <sup>12</sup> · (2 <sup>13-1</sup> )	33550336	2 × 2 <sup>24</sup> - 2 <sup>12</sup> = 33550336	4 <sup>13</sup> / 2 - 2 <sup>12</sup> = 33550336	2 × 4096 <sup>2</sup> - 4096 = 33550336
6	17	6	131071	2 <sup>16</sup> · (2 <sup>17-1</sup> )	8589869056	2 × 2 <sup>32</sup> - 2 <sup>16</sup> = 8589869056	4 <sup>17</sup> / 2 - 2 <sup>16</sup> = 8589869056	2 × 65536 <sup>2</sup> - 65536 = 8589869056
7	19	6	524287	2 <sup>18</sup> · (2 <sup>19-1</sup> )	137438691328	2 × 2 <sup>36</sup> - 2 <sup>18</sup> = 137438691328	4 <sup>19</sup> / 2 - 2 <sup>18</sup> = 137438691328	2 × 262144 <sup>2</sup> - 262144 = 137438691328
8	31	10	2147483647	2 <sup>20</sup> · (2 <sup>31-1</sup> )	230584...952128	2 × 2 <sup>60</sup> - 2 <sup>30</sup> = 2305843008139952128	4 <sup>31</sup> / 2 - 2 <sup>30</sup> = 2305843008139952128	2 × 107371824 <sup>2</sup> - 107371824 = 2305843008139952128
9	61	19	2305843008139952128	2 <sup>60</sup> · (2 <sup>61-1</sup> )	265845...842176	2 × 2 <sup>120</sup> - 2 <sup>60</sup> = 2658455991569831744654693636	4 <sup>61</sup> / 2 - 2 <sup>60</sup> = 2658455991569831744654693636	2 × 1152921504606846976 <sup>2</sup> - 1152921504606846976 = 2658455991569831744654693636
10	89	27	618970019642690137449562111	2 <sup>88</sup> · (2 <sup>89-1</sup> )	191561...169216	2 × 2 <sup>176</sup> - 2 <sup>88</sup> = 1915619426082361072947934653	4 <sup>89</sup> / 2 - 2 <sup>88</sup> = 1915619426082361072947934653	2 × 3094850098213450687247811e26 <sup>2</sup> - 3094850098213450687247811e26 = 1915619426082361072947934653
11	107	33	162259276829213363391578010288127	2 <sup>106</sup> · (2 <sup>107-1</sup> )	131640...728128	2 × 2 <sup>212</sup> - 2 <sup>106</sup> = 131640364585696483372975664	4 <sup>107</sup> / 2 - 2 <sup>106</sup> = 131640364585696483372975664	2 × 8112963841460668169578901e31 <sup>2</sup> - 8112963841460668169578901e31 = 131640364585696483372975664
12	127	39	170141183460469231731687303715884105727	2 <sup>126</sup> · (2 <sup>127-1</sup> )	144740...152128	2 × 2 <sup>252</sup> - 2 <sup>126</sup> = 1447401115466452442794637676	4 <sup>127</sup> / 2 - 2 <sup>126</sup> = 1447401115466452442794637676	2 × 8507059173023461586584365e37 <sup>2</sup> - 8507059173023461586584365e37 = 1447401115466452442794637676
13	521	157	68647976601306097149...12574028291115057151	2 <sup>1030</sup> · (2 <sup>521-1</sup> )	235627...646976	2 × 2 <sup>1040</sup> - 2 <sup>520</sup> = 2356272345726734706578955e313	4 <sup>521</sup> / 2 - 2 <sup>520</sup> = 2356272345726734706578955e313	
14	607	183	53113799281676709868...70835393219031728127	2 <sup>606</sup> · (2 <sup>607-1</sup> )	141053...328128		4 <sup>607</sup> / 2 - 2 <sup>606</sup> = 141053783706712069063208e365	
15	1279	386	10407932194664399081...2071055703168729087	2 <sup>1278</sup> · (2 <sup>1279-1</sup> )	541625...291328		4 <sup>1279</sup> / 2 - 2 <sup>1278</sup> = 5416252628436584741265447e769	
16	2203	664	14759799152141802350...50419497686697771007	2 <sup>2202</sup> · (2 <sup>2203-1</sup> )	108925...782528		4 <sup>2203</sup> / 2 - 2 <sup>2202</sup> = 1089258355057829337698225e1326	
17	2281	687	44608755718375842957...64133172418132836351	2 <sup>2280</sup> · (2 <sup>2281-1</sup> )	994970...915776		4 <sup>2281</sup> / 2 - 2 <sup>2280</sup> = 99497054337086473424352e1372	
18	3217	969	25911708601320262777...46160677362909315071	2 <sup>3216</sup> · (2 <sup>3217-1</sup> )	335708...525056		4 <sup>3217</sup> / 2 - 2 <sup>3216</sup> = 3357083213198672443701088e1936	
19	4253	1281	19079700752443907380...76034687815350484991	2 <sup>4252</sup> · (2 <sup>4253-1</sup> )	182017...377536		4 <sup>4253</sup> / 2 - 2 <sup>4252</sup> = 1820174904014043027383517e2560	
20	4423	1332	28554254222827961390...10231057902608580607	2 <sup>4422</sup> · (2 <sup>4423-1</sup> )	407672...534528		4 <sup>4423</sup> / 2 - 2 <sup>4422</sup> = 4076727171109442326628679e2662	
21	9689	2917	47822027880546120295...18992696826225754111	2 <sup>9688</sup> · (2 <sup>9689-1</sup> )	114347...577216		4 <sup>9689</sup> / 2 - 2 <sup>9688</sup> = 114347317503865227187051e5833	
22	9941	2993	34608828249085121524...19426224883789463551	2 <sup>9940</sup> · (2 <sup>9941-1</sup> )	598885...496576		4 <sup>9941</sup> / 2 - 2 <sup>9940</sup> = 5988854963873361592151583e5984	
23	11213	3376	28141120136973731333...67391476087696392191	2 <sup>11212</sup> · (2 <sup>11213-1</sup> )	395961...086336		4 <sup>11213</sup> / 2 - 2 <sup>11212</sup> = 3959613212817942196968288e6750	
24	19937	6002	43154247973881626480...36741539030968041471	2 <sup>19936</sup> · (2 <sup>19937-1</sup> )	931144...942656		4 <sup>19937</sup> / 2 - 2 <sup>19936</sup> = 931144559095633232126208e12002	
25	21701	6533	44867916611904333479...57410828353511882751	2 <sup>21700</sup> · (2 <sup>21701-1</sup> )	100656...605376		4 <sup>21701</sup> / 2 - 2 <sup>21700</sup> = 1006564970546400421807432e13065	
26	23209	6987	40287411577898877818...36743355523779264511	2 <sup>23208</sup> · (2 <sup>23209-1</sup> )	811537...666816		4 <sup>23209</sup> / 2 - 2 <sup>23208</sup> = 8115377658235102740836528e13972	
27	44497	13395	85450982430363380319...44867686961011228671	2 <sup>44496</sup> · (2 <sup>44497-1</sup> )	365093...827456		4 <sup>44497</sup> / 2 - 2 <sup>44496</sup> = 3650935199157135557732548e26789	
28	86243	25962	53692799550275632152...99857021709433438207	2 <sup>86242</sup> · (2 <sup>86243-1</sup> )	144145...406528		4 <sup>86243</sup> / 2 - 2 <sup>86242</sup> = 1441458361773039563149464e51923	
29	110503	33265	52192831334175505976...69951621083465515007	2 <sup>110502</sup> · (2 <sup>110503-1</sup> )	136204...862528		4 <sup>110503</sup> / 2 - 2 <sup>110502</sup> = Undefined (maximum reached for app)	
30	132049	39751	51274027626932072381...52138578455730061311	2 <sup>132048</sup> · (2 <sup>132049-1</sup> )	131451...550016			
31	216091	65050	74609310306466134368...91336204103815528447	2 <sup>216090</sup> · (2 <sup>216091-1</sup> )	278327...880128			
32	756839	227832	17413590682008709732...02603793328544677887	2 <sup>756838</sup> · (2 <sup>756839-1</sup> )	151616...731328			
33	859433	258716	12949812560420764966...02414267243500142591	2 <sup>859432</sup> · (2 <sup>859433-1</sup> )	838488...167936			
34	1257787	378632	41224577362142867472...31257188976089366527	2 <sup>1257786</sup> · (2 <sup>1257787-1</sup> )	849732...704128			
35	1398269	420921	81471756441257307514...85532025868451315711	2 <sup>1398268</sup> · (2 <sup>1398269-1</sup> )	331882...375616			
36	2976221	895832	62334007624857864988...76506256743729201151	2 <sup>2976220</sup> · (2 <sup>2976221-1</sup> )	194276...462976			
37	3021377	909526	12741168303009336743...25422631973024694271	2 <sup>3021376</sup> · (2 <sup>3021377-1</sup> )	811686...457856			
38	6972593	2098960	43707574412708137883...35366526142924193791	2 <sup>6972592</sup> · (2 <sup>6972593-1</sup> )	955176...572736			
39	13466917	4053946	92494773800670132224...30073855470256259071	2 <sup>13466916</sup> · (2 <sup>13466917-1</sup> )	427764...021056			
40	20996011	6320430	12597689545033010502...94714065762855682047	2 <sup>20996010</sup> · (2 <sup>20996011-1</sup> )	793508...896128			
41	24036583	7235733	29941042940415717208...67436921882733969407	2 <sup>24036582</sup> · (2 <sup>24036583-1</sup> )	448233...950528			
42	25964951	7816230	12216463006127794810...98933257280577077247	2 <sup>25964950</sup> · (2 <sup>25964951-1</sup> )	746209...088128			
43	30402457	9152052	31541647561884608093...11134297411652943871	2 <sup>30402456</sup> · (2 <sup>30402457-1</sup> )	497437...704256			
44	32582657	9808358	12457502601536945540...11752880154053967871	2 <sup>32582656</sup> · (2 <sup>32582657-1</sup> )	775946...120256			
45	37156667	11185272	20225440689097733553...21340265022308220927	2 <sup>37156666</sup> · (2 <sup>37156667-1</sup> )	204534...480128			
46	42643801	12837064	16987351645274162247...84101954765562314751	2 <sup>42643800</sup> · (2 <sup>42643801-1</sup> )	144285...253376			
47	43112609	12978189	31647026933025592314...80022181166697152511	2 <sup>43112608</sup> · (2 <sup>43112609-1</sup> )	500767...378816			
48?	57885161	17425170	58188726623224644217...46141988071724285951	2 <sup>57885160</sup> · (2 <sup>57885161-1</sup> )	169296...130176			
49?	74207281	22338618	30037641808460618205...8701073391086436351	2 <sup>74207280</sup> · (2 <sup>74207281-1</sup> )	451129...315776			
50?	77232917	23249425	4673331833592310998...82730618069762179071	2 <sup>77232916</sup> · (2 <sup>77232917-1</sup> )	109200...301056			
51?	82589933	24862048	14889444574204132554...37951210325217902591	2 <sup>82589932</sup> · (2 <sup>82589933-1</sup> )	110847...207936			
#	p	z, digits	z, value	xz=PN	xz=PN	*2(2 <sup>2p-2</sup> )-2 <sup>p-1</sup> =PN	*(4 <sup>p/2</sup> )-2 <sup>p-1</sup> = PN	*2x <sup>2</sup> -x = PN
? Provisional ranking, not all candidates between M57,885,161 and M82,589,933 have been eliminated.								
Table 104: PN NEW Calculations with "p" and "x"						*2(2 <sup>2p-2</sup> )-2 <sup>p-1</sup> = 2[(2 <sup>p-1</sup> )] <sup>2</sup> -2 <sup>p-1</sup> = (4 <sup>p/2</sup> )-2 <sup>p-1</sup> = 2x <sup>2</sup> -x	*2(2 <sup>2p-2</sup> )-2 <sup>p-1</sup> = 2[(2 <sup>p-1</sup> )] <sup>2</sup> -2 <sup>p-1</sup> = (4 <sup>p/2</sup> )-2 <sup>p-1</sup> = 2x <sup>2</sup> -x	*2(2 <sup>2p-2</sup> )-2 <sup>p-1</sup> = 2[(2 <sup>p-1</sup> )] <sup>2</sup> -2 <sup>p-1</sup> = (4 <sup>p/2</sup> )-2 <sup>p-1</sup> = 2x <sup>2</sup> -x
NEW methods to calculate the Perfect Number (PN) from either the "p" OR "x" value. The "x" value equals the Short Side of the PN Rectangle on the MPS. xz=2 <sup>p-1</sup> yx-1 and z=Mp=xy, with PN=xz. Based on the geometry of the Mersenne Prime Square (MPS). (Reference: <a href="https://www.mersenne.org/primes/">https://www.mersenne.org/primes/</a> Table is reconfigured from reference + additional info (RED)). Copyright © 2022, Reginald Brooks, Brooks Design.								