

Table182: (z<sup>2</sup> + z)/2=PN

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p	Rows: xz		PN=2 <sup>p-1</sup> (2 <sup>p</sup> -1)	PN=(z <sup>2</sup> + z)/2			
	x	z = Mp	PN=xz	MPS/2	+	Mp/2	equals
	x	z = Mp	PN	z <sup>2</sup> /2	+	z/2	PN
2	2	3	6	4.5	+	1.5	6
3	4	7	28	24.5	+	3.5	28
4	8	15	120	112.5	+	7.5	120
5	16	31	496	480.5	+	15.5	496
6	32	63	2016	1984.5	+	31.5	2016
7	64	127	8128	8064.5	+	63.5	8128
8	128	255	32640	32512.5	+	127.5	32640
9	256	511	130816	130560.5	+	255.5	130816
10	512	1023	523776	523264.5	+	511.5	523776
11	1024	2047	2096128	2095104.5	+	1023.5	2096128
12	2048	4095	8386560	8384512.5	+	2047.5	8386560
13	4096	8191	33550336	33546240.5	+	4095.5	33550336
14	8192	16383	134209536	134201344.5	+	8191.5	134209536
15	16384	32767	536854528	536838144.5	+	16383.5	536854528
16	32768	65535	2147450880	2147418112.5	+	32767.5	2147450880
17	65536	131071	8589869056	8589803520.5	+	65535.5	8589869056
18	131072	262143	34359607296	34359476224.5	+	131071.5	34359607296
19	262144	524287	137438691328	137438429184.5	+	262143.5	137438691328
20	524288	1048575	549755289600	549754765312.5	+	524287.5	549755289600
21	1048576	2097151	2199022206976	2199021158400.5	+	1048575.5	2199022206976
22	2097152	4194303	8796090925056	8796088827904.5	+	2097151.5	8796090925056
23	4194304	8388607	35184367894528	35184363700224.5	+	4194303.5	35184367894528
24	8388608	16777215	140737479966720	140737471578112.5	+	8388607.5	140737479966720
25	16777216	33554431	562949936644096	562949919866880.5	+	16777215.5	562949936644096
26	33554432	67108863	2251799780130816	2251799746576384.5	+	33554431.5	2251799780130816
27	67108864	134217727	9007199187632128	9007199120523264.5	+	67108863.5	9007199187632128
28	134217728	268435455	36028796884746240	36028796750528512.5	+	134217727.5	36028796884746240
29	268435456	536870911	144115187807420416	144115187538984960.5	+	268435455.5	144115187807420416
30	536870912	1073741823	576460751766552576	576460751229681664.5	+	536870911.5	576460751766552576
31	1073741824	2147483647	2305843008139952128	2305843007066210304.5	+	1073741823.5	2305843008139952128

Table182: (z<sup>2</sup> + z)/2=PN PN=xz An alternative to the Euclid-Euler Theorem — PN=2<sup>p-1</sup>(2<sup>p</sup>-1) — that requires knowing “p.” Here one only needs to know “z” and “z” naturally forms from the Running Sums (Σ) of the Butterfly Fractal 1 (BF1). z/2\*2+0.5=next z/2.

**For TRUE Mp-PN: (except z=2) and other SET 1 “containers”**

All z end 1 or 7 and are NOT ÷3  
 All z<sup>2</sup> end 1 or 9

All z/2 end 5.5 or 3.5  
 All z<sup>2</sup>/2 end 0.5 or 4.5

Σ 6 or 8 All PN

**For NOT TRUE Mp-PN SET 2 “containers”-only:**

All z end 3 or 5 and are ÷3  
 All z<sup>2</sup> end 9 or 5

All z/2 end 1.5 or 7.5  
 All z<sup>2</sup>/2 end 4.5 or 2.5

Σ 6 or 0 All PN

- 1•0.5=0.5— +5.5=6 SET 1
- 3•0.5=1.5 - - - +4.5=6 SET 2
- 5•0.5=2.5- - - - +7.5=10 SET 2
- 7•0.5=3.5— +4.5=8 SET 1
- 9•0.5=4.5— +3.5=8 - - - +1.5=6 SET 1, SET 2
- 11•0.5=5.5— +0.5=6 SET 1
- 13•0.5=6.5
- 15•0.5=7.5- - - - +2.5=10 SET 2
- 17•0.5=8.5
- 19•0.5=9.5

**Patterns in Columns (minor exception 1st x row)**

x: EVENS ÷4, end sequence: 2-4-8-6— 2-4-8-6— ...  
 z: ODDS, SET 1 NOT ÷3, SET 2 ÷3, end sequence: 3-7-5-1— 3-7-5-1— ...  
 PN: EVENS ÷4, end seq.: 6--8--0--6-- --6--8--0--6-- ...  
 MPS/2, end sequence: 4.5-4.5-2.5-0.5— 4.5-4.5-2.5-0.5— ...  
 Mp/2, end sequence: 1.5-3.5-7.5-5.5— 1.5-3.5-7.5-5.5— ...