MJN-The Perfect Squares

Multiples of five is the exciting part of my algorithm.
By using, the following formula appears this pattern:

n
n x n
2n + 1 ↑+2

5
25
1113151719

10
100
2123252729

15
225
3133353739

20
400
4143454749

25
625
5153555759

30
900
6163656769

35
1225
7173757779

40
1600
8183858789

45
2025
9193959799

50
2500
101103105107109

55
3025
111113115117119

60
3600
121123125127129

65
4225
131133135137139

70
4900
141143145147149

75
5625
151153155157159

80
6400
161163165167169

85
7225
171173175177179

90
8100
181183185187189

95
9025
191193195197199

100
10000
201203205207209

MJN – The Perfect Squares Pattern

Examples of how you can find the square root of the perfect squares.
Remember: MJN's Serial no.-method is required.
How do you find √121-using MJN – Positions Algorithm?
There are two formulas:

$$+ \rightsquigarrow (2n+1)\uparrow^{+2} \qquad - \rightsquigarrow (2n-1)\downarrow_{-2}$$

where **n** is the square root of two perfect squares that number falls between.
where $\uparrow^{+2}$ means you have to find the serial number for the next odd number.
$\downarrow_{-2}$ means you have to find the serial number for the last odd number.
You can determine between any *two perfect squares the number falls.* (The first belongs to multiples of 5 multiplied by itself, and the other belonging to the multiples of 10 multiplied by itself).
Since 121 is bigger than 10x10, but less than 15x15, you can immediately say that the square root of 121 should be a number between n = 10 and n = 15.

By using formula 1: $+ \rightsquigarrow (2n+1)\uparrow^{+2}$ **(2n + 1 = 2. 10 + 1 = 21, where n = 10)**

√121 = 100 + 21 ⇝ 121, the next odd number is **23**.
Calculate Serial no. to **23.** Serial no. to **23** = (23 – 1): 2 = 11. So √121 = **11**
or

By using formula 2: $- \rightsquigarrow (2n-1)\downarrow_{-2}$ **(2n - 1 = 2. 15 - 1 = 29, where n = 15)**

√121 = 225 - 29 ⇝ 196 - 27 ⇝ 169 – 25 ⇝ 144 – **23** ⇝121.
Calculate serial no. to the same last odd number. Serial no. to **23** = (23 – 1): 2 = 11. So √121 = **11**

√196 = 100 + 21 ⇝ 121+ 23 ⇝ 144 + 25 ⇝ 169 + 27 ⇝ 196, the next odd number is **29**.
Calculate Serial no. to **29**. Serial no. to **29** = (29 – 1): 2 = 14. So √196 = **14**
or

√196 = 225 - 29 ⇝ ⇝ 196.
Calculate serial no. to the same last odd number. Serial no. Serial no. to **29** = (29 – 1): 2 = 14. So √196 = **14**

√256 = 225 + 31 ⇝ 256, the next odd number is **33**.
Calculate Serial no. to **33**. Serial no. to **33** = (33 – 1): 2 = 16. So √256 = **16**
or

√256 = 400 - 39 ⇝ 361 - 37 ⇝ 324 - 35 ⇝ 289 - **33**⇝ 256.
Calculate serial no. to the same last odd number. Serial no. to **33** = (33 – 1): 2 = 16. So √256 = **16**

√441 = 400 + 41 ⇝ 441, the next odd number is **43**.
Calculate Serial no. to **43**. Serial no. to **43** = (43 – 1): 2 = 21. So √441 = **21**
or

√441 = 625 - 49 ⇝ 576 - 47 ⇝ 529 - 45 ⇝ 484 - **43**⇝ 441.
Calculate serial no. to the same last odd number. Serial no. to **43** = (43 – 1): 2 = 21. So √441 = **21**

√676= 625 + 51 ⇝ 676, the next odd number is **53**.
Calculate Serial no. to **53**. Serial no. to **53** = (53 – 1): 2 = 26. So √676 = **26**
or
√676 = 900 - 59 ⇝ 841 - 57 ⇝ 784 - 55 ⇝ 729 - **53**⇝ 676.
Calculate serial no. to the same last odd number. Serial no. to **53** = (53 – 1): 2 = 26. So √676 = **26**

√729= 625 + 51 ⇝ 676 + 53 ⇝ 729, the next odd number is **55**.
Calculate Serial no. to **55**. Serial no. to **55** = (55 – 1): 2 = 27. So √729 = **27**
or
√729 = 900 - 59 ⇝ 841 - 57 ⇝ 784 - 55 ⇝ 729.
Calculate serial no. to the same last odd number. Serial no. to **55** = (55 – 1): 2 = 27. So √729 = **27**

√961= 900 + 61 ⇝ 961, the next odd number is **63**.
Calculate Serial no. to **63**. Serial no. to **63** = (63 – 1): 2 = 31. So √961 = **31**
or
√961 = 1225 - 69 ⇝ 1156 - 67 ⇝ 1089 - 65 ⇝ 1024 - **63**⇝ 961.
Calculate serial no. to the same last odd number. Serial no. to **63** = (63 – 1): 2 = 31. So √961 = **31**

√1024 = 900 + 61 ⇝ 961 + 63 ⇝ 1024, the next odd number is **65**.
Calculate Serial no. to **65**. Serial no. to **65** = (65 – 1): 2 = 32. So √1024 = **32**
or
√1024 = 1225 - 69 ⇝ 1156 - 67 ⇝ 1089 – **65** ⇝ 1024.
Calculate serial no. to the same last odd number. Serial no. to **65** = (65 – 1): 2 = 32. So √1024 = **32**

√1156 = 900 + 61 ⇝ 961 + 63 ⇝ 1024+ 65 ⇝ 1089 + 67 ⇝ 1156, the next odd number is **69**.
Calculate Serial no. to **69**. Serial no. to **69** = (69 – 1): 2 = 34. So √1156 = **34**
or
√1156 = 1225 - **69** ⇝ 1156.
Calculate serial no. to the same last odd number. Serial no. to **69** = (69 – 1): 2 = 34. So √1156 = **34**

√1521 = 1225 + 71 ⇝ 1269 + 73 ⇝ 1369+ 75 ⇝ 1444 + 77 ⇝ 1521, the next odd number is **79**.
Calculate Serial no. to **79**. Serial no. to **79** = (79 – 1): 2 = 39. So √1521 = **39**
or
√1521 = 1600 - **79** ⇝ 1521.
Calculate serial no. to the same last odd number. Serial no. to **79** = (79 – 1): 2 = 39. So √1521 = **39**

√1849 = 1600 + 81 ⇝ 1681 + 83 ⇝ 1467+ 85 ⇝ 1849, the next odd number is **87**.
Calculate Serial no. to **87**. Serial no. to **87** = (87 – 1): 2 = 43. So √1849 = **43**
or
√1849 = 2025 - 89 ⇝ 1936 - **87** ⇝ 1849.
Calculate serial no. to the same last odd number. Serial no. to **87** = (87– 1): 2 = 43. So √1849 = **43**

√3136 = 3025 + 111 ⇝ 3136, the next odd number is **113**.
Calculate Serial no. to **113**. Serial no. to **113** = (113 – 1): 2 = 56. So √3136 = **56**
or
√3136 = 3600 - 119 ⇝ 3481 - 117 ⇝ 3364 - 115 ⇝ 3249 - **113** ⇝ 3136.
Calculate serial no. to the same last odd number. Serial no. to **113** = (113– 1): 2 = 56. So √3136 = **56**

√4761 = 4225 + 131 ⇝ 4356 + 133 ⇝ 4489 + 135 ⇝ 4624 + 137 ⇝ 4761, the next odd number is **139**. Calculate Serial no. to **139**. Serial no. to **139** = (139 – 1): 2 = 69. So √4761 = **69**
or
√4761 = 4900 - **139** ⇝ 4761.
Calculate serial no. to the same last odd number. Serial no. to **139** = (139– 1): 2 = 69. So √4761 = **69**

√5625 ⇝ 56 = 7 x 8 and √25 = 5. So √5625 = **75** (table 5 rule)

√5929 = 5625 + 151 ⇝ 5776 + 153 ⇝ 5929, the next odd number is **155**.
Calculate Serial no. to **155**. Serial no. to **155** = (155 – 1): 2 = 77. So √5929 = **77**
or
√5929 = 6400 - 159 ⇝ 6241 - 157 ⇝ 6084 - **155** ⇝ 5929.
Calculate serial no. to the same last odd number. Serial no. to **155** = (155– 1): 2 = 77. So √5929 = **77**

√8836 = 8100 + 181 ⇝ 8281 + 183 ⇝ 8464 + 185 ⇝ 4649 + 187 ⇝ 8836, the next odd number is **189**. Calculate Serial no. to **189**. Serial no. to **189** = (189 – 1): 2 = 94. So √8836 = **94**
or
√8836 = 9025 - **189** ⇝ 8836.
Calculate serial no. to the same last odd number. Serial no. to **189** = (189– 1): 2 = 94. So √8836 = **94**

√9801 = 9025 + 191 ⇝ 9216 + 193 ⇝ 9409 + 195 ⇝ 9604 + 197 ⇝ 9801, the next odd number is **199**. Calculate Serial no. to **199**. Serial no. to **199** = (199 – 1): 2 = 99. So √9801 = **99**
or
√9801 = 10000 - **199** ⇝ 9801.
Calculate serial no. to the same last odd number. Serial no. to **199** = (199 – 1): 2 = 99. So √9801 = **99**

MJN – Expanded Pattern Of The Perfect Squares

0		1		4		9		16		25		36	
	↘ +1		↗ +3		+5		+7		+9		+11		+13
49		64		81		100		121		144		169	
	+15		+17		+19		+21		+23		+25		+27
196		225		256		289		324		361		400	
	+29		+31		+33		+35		+37		+39		+41
441		484		529		576		625		676		729	
	+43		+45		+47		+49		+51		+53		+55
784		841		900		961		1024		1089		1156	
	+57		+59		+61		+63		+65		+67		+69
1225		1296		1369		1444		1521		1600		1681	
	+71		+73		+75		+77		+79		+81		+83
1764		1849		1936		2025		2116		2209		2304	
	+85		+87		+89		+91		+93		+95		+97
2401		2500		2601		2704		2809		2916		3025	
	+99		+101		+103		+105		+107		+109		+111
3136		3249		3364		3481		3600		3721		3844	
	+113		+115		+117		+119		+121		+123		+125
3969		4096		4225		4356		4489		4624		4761	
	+127		+129		+131		+133		+135		+137		+139
4900		5041		5184		5329		5476		5625		5776	
	+141		+143		+145		+147		+149		+151		+153
5929		6084		6241		6400		6561		6724		6889	
	+155		+157		+159		+161		+163		+165		+167

Mohammad J. Nasser Tilst school - Aarhus, DENMARK 2016

7056	7225	7396	7569	7744	7921	8100
+169	+171	+173	+175	+177	+179	+181
8281	8464	8649	8836	9025	9216	9409
+183	+185	+187	+189	+191	+193	+195
9604	9801	10000	10201	10404	10609	10816
+197	+199	+201	+203	+205	+207	+209
11025	11236	11449	11664	11881	12100	12321
+211	+213	+215	+217	+219	+221	+223
12544	12769	12996	13225	13456	13689	13924
+225	+227	+229	+231	+233	+235	+237
14161	14400	14641	14884	15129	15376	15625
+239	+241	+243	+245	+247	+249	+251
15876	16129	16384	16641	16900	17161	17424
+253	+255	+257	+259	+261	+263	+265
17689	17956	18225	18496	18769	19044	19321
+267	+269	+271	+273	+275	+277	+279
19600	19881	20164	20449	20736	21025	21316
+281	+283	+285	+287	+289	+291	+293
21609	21904	22201	22500	22801	23104	23409
+295	+297	+299	+301	+303	+305	+307
23716	24025	24336	24649	24964	25281	25600
+309	+311	+313	+315	+317	+319	+321
25921	26244	26569	26896	27225	27556	27889
+323	+325	+327	+329	+331	+333	+335
28224	28561	28900	29241	29584	29929	30276
+337	+339	+341	+343	+345	+347	+349

30625	30976	31329	31684	32041	32400	32761
+351	+353	+355	+357	+359	+361	+363
33124	33489	33856	34225	34596	34969	35344
+365	+367	+369	+371	+373	+375	+377
35721	36100	36481	36864	37249	37636	38025
+379	+381	+383	+385	+387	+389	+391
38416	38809	39204	39601	40000	40401	40804
+393	+395	+397	+399	+401	+403	+405
41209	41616	42025	42436	42849	43264	43681
+407	+409	+411	+413	+415	+417	+419
44100	44521	44944	45369	45796	46225	46656
+421	+423	+425	+427	+429	+431	+433
47089	47524	47961	48400	48841	49284	49729
+435	+437	+439	+441	+443	+445	+447
50176	50625	51076	51529	51984	52441	52900
+449	+451	+453	+455	+457	+459	+461
53361	53824	54289	54756	55225	55696	56169
+463	+465	+467	+469	+471	+473	+475
56644	57121	57600	58081	58564	59049	59536
+477	+479	+481	+483	+485	+487	+489
60025	60516	61009	61504	62001	62500	63001
+491	+493	+495	+497	+499	+501	+503
63504	64009	64516	65025	65536	66049	66564
+505	+507	+509	+511	+513	+515	+517
67081	67600	68121	68644	69169	69696	70225
+519	+521	+523	+525	+527	+529	+531

70756	71289	71824	72361	72900	73441	73984
+533	+535	+537	+539	+541	+543	+545
74529	75076	75625	76176	76729	77284	77841
+547	+549	+551	+553	+555	+557	+559
78400	78961	79524	80089	80656	81225	81796
+561	+563	+565	+567	+569	+571	+573
82369	82944	83521	84100	84681	85264	85849
+575	+577	+579	+581	+583	+585	+587
86436	87025	87616	88209	88804	89401	90000
+589	+591	+593	+595	+597	+599	+601
90601	91204	91809	92416	93025	93636	94249
+603	+605	+607	+609	+611	+613	+615
94864	95481	96100	96721	97344	97969	98596
+617	+619	+621	+623	+625	+627	+629
99225	99856	100489	101124	101761	102400	103041
+631	+633	+635	+637	+639	+641	+643
103684	104329	104976	105625	106276	106929	107584
+645	+647	+649	+651	+653	+655	+657
108241	108900	109561	110224	110889	111556	112225
+659	+661	+663	+665	+667	+669	+671
112896	113569	114244	114921	115600	116281	116964
+673	+675	+677	+679	+681	+683	+685
117649	118336	119025	119716	120409	121104	121801
+687	+689	+691	+693	+695	+697	+699
122500	123201	123904	124609	125316	126025	126736
+701	+703	+705	+707	+709	+711	+713

127449	128164	128881	129600	130321	131044	131769
+715	+717	+719	+721	+723	+725	+727
132496	133225	133956	134689	135424	136161	136900
+729	+731	+733	+735	+737	+739	+741
137641	138384	139129	139876	140625	141376	142129
+743	+745	+747	+749	+751	+753	+755
142884	143641	144400	145161	145924	146689	147456
+757	+759	+761	+763	+765	+767	+769
1448225	148996	1449769	150544	151321	152100	152881
+771	+773	+775	+777	+779	+781	+783
153664	154449	155236	156025	156816	157609	158404
+785	+787	+789	+791	+793	+795	+797
1559201	160000	160801	161604	162409	163216	164025
+799	+801	+803	+805	+807	+809	+811
164836	1665649	166464	167281	168100	168921	169744
+813	+815	+817	+819	+821	+823	+825
170569	171396	172225	173056	173889	174724	175561
+827	+829	+831	+833	+835	+837	+839
176400	177241	178084	178929	179776	180625	181476
+841	+843	+845	+847	+849	+851	+853
182329	183184	184041	184900	185761	186624	187489
+855	+857	+859	+861	+863	+865	+867
188356	189225	190096	190969	191844	192721	193600
+869	+871	+873	+875	+877	+879	+881
194481	195364	196249	197136	198025	198916	199809
+883	+885	+887	+889	+891	+893	+895

200704 +897 201601 +899 202500 +901 203401 +903 204304 +905 205209 +907 206116 +909

207025 +911 207936 +913 208849 +915 209764 +917 210681 +919 211600 +921 212521 +923

213444 +925 214369 +927 215296 +929 216225 +931 217156 +933 218089 +935 219024 +937

219961 +939 220900 +941 221841 +943 222784 +945 223729 +947 224676 +949 225625 +951

226576 +953 227529 +955 228484 +957 229441 +959 230400 +961 231361 +963 232324 +965

233289 +967 234256 +969 235225 +971 236196 +973 237169 +975 238144 +977 239121 +979

240100 +981 241081 +983 242064 +985 243049 +987 244036 +989 245025 +991 246016 +993

247009 +995 248004 +997 249001 +999 250000

And so on

See you with more square roots