

The number $M(n,k)$ of monotone Boolean functions of n variables with k mincuts ($1 \leq k \leq 10$)

$$M(n,1)=2^n$$

$$M(n,2)=(1/2!) * (4^{n-2} * 3^{n+2} * 2^n)$$

$$M(n,3)=(1/3!) * (8^{n-6} * 6^{n+6} * 5^{n+3} * 4^{n-6} * 3^{n+2} * 2^n)$$

$$M(n,4)=(1/4!) * (16^{n-12} * 12^{n+24} * 10^{n+4} * 9^{n-18} * 8^{n+6} * 7^{n-36} * 6^{n+36} * 5^{n+11} * 4^{n-22} * 3^{n+6} * 2^n)$$

$$M(n,5)=(1/5!) * (32^{n-20} * 24^{n+60} * 20^{n+20} * 18^{n+10} * 17^{n-110} * 16^{n-120} * 15^{n+150} * 14^{n+120} * 13^{n-240} * 12^{n+20} * 11^{n+240} * 10^{n+40} * 9^{n-205} * 8^{n+60} * 7^{n-210} * 6^{n+210} * 5^{n+50} * 4^{n-100} * 3^{n+24} * 2^n)$$

$$M(n,6)=(1/6!) * (64^{n-30} * 48^{n+120} * 40^{n+60} * 36^{n+60} * 34^{n-12} * 33^{n-345} * 32^{n-720} * 30^{n+810} * 28^{n+120} * 27^{n+480} * 26^{n+360} * 25^{n-480} * 24^{n-720} * 23^{n-240} * 22^{n-540} * 21^{n+1380} * 20^{n+750} * 19^{n+60} * 18^{n-210} * 17^{n-1535} * 16^{n-1820} * 15^{n+2250} * 14^{n+1800} * 13^{n-2820} * 12^{n+300} * 11^{n+2040} * 10^{n+340} * 9^{n-1815} * 8^{n+510} * 7^{n-1350} * 6^{n+1350} * 5^{n+274} * 4^{n-548} * 3^{n+120} * 2^n)$$

$$M(n,7)=(1/7!) * (128^{n-42} * 96^{n+210} * 80^{n+140} * 72^{n+210} * 68^{n-84} * 66^{n+14} * 65^{n-819} * 64^{n-2520} * 60^{n+2730} * 56^{n+840} * 54^{n+840} * 52^{n-420} * 51^{n+2940} * 50^{n+630} * 48^{n-5040} * 46^{n+840} * 45^{n-1260} * 44^{n+1680} * 43^{n-9660} * 42^{n+1260} * 41^{n+3360} * 40^{n-7560} * 39^{n+11130} * 38^{n+5880} * 37^{n+9240} * 36^{n+2982} * 35^{n-6300} * 34^{n-8652} * 33^{n-9905} * 32^{n-8400} * 31^{n-8540} * 30^{n+13860} * 29^{n+14490} * 28^{n-5040} * 27^{n+10500} * 26^{n+10080} * 25^{n-8120} * 24^{n-15050} * 23^{n-5040} * 22^{n-11340} * 21^{n+20580} * 20^{n+15750} * 19^{n-1540} * 18^{n-5810} * 17^{n-16485} * 16^{n-21420} * 15^{n+26250} * 14^{n+21000} * 13^{n-29820} * 12^{n+3500} * 11^{n+17640} * 10^{n+2940} * 9^{n-16016} * 8^{n+4410} * 7^{n-9744} * 6^{n+9744} * 5^{n+1764} * 4^{n-3528} * 3^{n+720} * 2^n)$$

$$M(n,8)=(1/8!) * (256^{n-56} * 192^{n+336} * 160^{n+280} * 144^{n+560} * 136^{n-336} * 132^{n+112} * 130^{n-16} * 129^{n-1652} * 128^{n-6720} * 120^{n+7140} * 112^{n+3360} * 108^{n-3360} * 102^{n+13440} * 100^{n+672} * 99^{n-672} * 98^{n+7224} * 96^{n-20160} * 92^{n+6720} * 90^{n-2240} * 88^{n+13440} * 86^{n+3360} * 85^{n-63840} * 84$$

$^{n-3360} * 83 ^{n+ 11760} * 82 ^{n-2800} * 81 ^{n-1960} * 80 ^{n-47040} * 78 ^{n-6720} * 77$
 $^{n+ 61320} * 76 ^{n-13440} * 75 ^{n+ 44800} * 74 ^{n+ 5040} * 73 ^{n+ 77840} * 72 ^{n-6720} *$
 $71 ^{n+ 52416} * 70 ^{n+ 28560} * 69 ^{n-51912} * 68 ^{n+ 56} * 67 ^{n-99792} * 66 ^{n+ 30632}$
 $* 65 ^{n-38318} * 64 ^{n+ 21840} * 63 ^{n-80640} * 62 ^{n+ 6720} * 61 ^{n-128240} * 60 ^{n-}$
 $40320 * 59 ^{n+ 57120} * 58 ^{n-55440} * 57 ^{n+ 190680} * 56 ^{n+ 30240} * 55 ^{n+ 105840}$
 $* 54 ^{n-6720} * 53 ^{n+ 50400} * 52 ^{n-42000} * 51 ^{n+ 21840} * 50 ^{n+ 44940} * 49 ^{n-}$
 $38220 * 48 ^{n-28560} * 47 ^{n-194320} * 46 ^{n+ 4480} * 45 ^{n+ 15120} * 44 ^{n+ 151200} *$
 $43 ^{n-283920} * 42 ^{n+ 52080} * 41 ^{n+ 46200} * 40 ^{n-285712} * 39 ^{n+ 299320} * 38 ^{n+}$
 $220080 * 37 ^{n+ 252840} * 36 ^{n+ 65016} * 35 ^{n-195720} * 34 ^{n-234024} * 33 ^{n-}$
 $185640 * 32 ^{n-235130} * 31 ^{n-47600} * 30 ^{n+ 388080} * 29 ^{n+ 190260} * 28 ^{n-}$
 $173040 * 27 ^{n+ 166320} * 26 ^{n+ 186480} * 25 ^{n-120680} * 24 ^{n-229880} * 23 ^{n-}$
 $77280 * 22 ^{n-173880} * 21 ^{n+ 272160} * 20 ^{n+ 241500} * 19 ^{n-38080} * 18 ^{n-96320} *$
 $17 ^{n-170471} * 16 ^{n-241640} * 15 ^{n+ 294000} * 14 ^{n+ 235200} * 13 ^{n-316428} * 12$
 $^{n+ 39200} * 11 ^{n+ 162456} * 10 ^{n+ 27076} * 9 ^{n-149324} * 8 ^{n+ 40614} * 7 ^{n-78792}$
 $* 6 ^{n+ 78792} * 5 ^{n+ 13068} * 4 ^{n-26136} * 3 ^{n+ 5040} * 2 ^{n}$

$M(n,9)=(1/9!) * (512 ^{n-72} * 384 ^{n+ 504} * 320 ^{n+ 504} * 288 ^{n+ 1260} * 272 ^{n-1008}$
 $* 264 ^{n+ 504} * 260 ^{n-144} * 258 ^{n+ 18} * 257 ^{n-2988} * 256 ^{n-15120} * 240 ^{n+}$
 $15876 * 224 ^{n+ 10080} * 216 ^{n-5040} * 208 ^{n-15120} * 204 ^{n+ 45360} * 200 ^{n+ 6048}$
 $* 198 ^{n-6048} * 196 ^{n-1008} * 195 ^{n+ 1008} * 194 ^{n+ 28224} * 192 ^{n-60480} * 184$
 $^{n+ 30240} * 180 ^{n+ 2520} * 176 ^{n+ 60480} * 172 ^{n+ 30240} * 170 ^{n-272160} * 168 ^{n-}$
 $30240 * 166 ^{n-6048} * 165 ^{n+ 63504} * 164 ^{n+ 6048} * 163 ^{n-28224} * 162 ^{n-48384} *$
 $160 ^{n-151200} * 156 ^{n-60480} * 154 ^{n+ 5040} * 153 ^{n+ 219240} * 152 ^{n-151200} *$
 $150 ^{n+ 15120} * 149 ^{n+ 206640} * 148 ^{n-15120} * 147 ^{n+ 50400} * 146 ^{n+ 10080} *$
 $145 ^{n+ 367920} * 144 ^{n-60480} * 142 ^{n-30240} * 141 ^{n+ 364392} * 140 ^{n+ 20160} *$
 $139 ^{n+ 252000} * 138 ^{n+ 15120} * 137 ^{n-288288} * 136 ^{n+ 45360} * 135 ^{n+ 33768} *$
 $134 ^{n+ 33264} * 133 ^{n-678384} * 132 ^{n+ 72} * 131 ^{n+ 155232} * 130 ^{n-121536} * 129$
 $^{n-29694} * 128 ^{n+ 438480} * 126 ^{n+ 60480} * 125 ^{n-423360} * 124 ^{n-90720} * 123$
 $^{n+ 120960} * 122 ^{n+ 60480} * 121 ^{n-848400} * 120 ^{n+ 7560} * 119 ^{n-302400} * 118$
 $^{n+ 166320} * 117 ^{n+ 189000} * 116 ^{n-362880} * 115 ^{n-1073520} * 114 ^{n+ 60480} *$
 $113 ^{n+ 1134000} * 112 ^{n-423360} * 111 ^{n+ 332640} * 110 ^{n+ 181440} * 109 ^{n+}$
 $952560 * 108 ^{n+ 90720} * 107 ^{n+ 241920} * 106 ^{n-214704} * 105 ^{n-30240} * 104 ^{n-}$
 $54432 * 103 ^{n+ 390096} * 102 ^{n-60480} * 101 ^{n-423360} * 100 ^{n+ 578592} * 99 ^{n+}$
 $1302588 * 98 ^{n+ 292320} * 97 ^{n-123732} * 96 ^{n+ 1285200} * 95 ^{n-1466640} * 94 ^{n+}$
 $650160 * 93 ^{n-766080} * 92 ^{n+ 211680} * 91 ^{n-2227680} * 90 ^{n+ 30240} * 89 ^{n-}$
 $1758960 * 88 ^{n-3024000} * 87 ^{n+ 2215080} * 86 ^{n-1199520} * 85 ^{n-514080} * 84 ^{n-}$
 $841680 * 83 ^{n+ 4445280} * 82 ^{n+ 594720} * 81 ^{n+ 588420} * 80 ^{n+ 1542240} * 79 ^{n-}$
 $3110688 * 78 ^{n+ 1179360} * 77 ^{n-534240} * 76 ^{n+ 1517040} * 75 ^{n+ 1890504} * 74$
 $^{n-1678320} * 73 ^{n+ 375816} * 72 ^{n-1511832} * 71 ^{n+ 783216} * 70 ^{n-398160} * 69$
 $^{n+ 841428} * 68 ^{n+ 2270016} * 67 ^{n-1814904} * 66 ^{n+ 2252964} * 65 ^{n-403704} * 64$
 $^{n-1406160} * 63 ^{n-4605930} * 62 ^{n-1370880} * 61 ^{n-2817360} * 60 ^{n-589680} * 59$
 $^{n+ 2328480} * 58 ^{n-1118880} * 57 ^{n+ 5935860} * 56 ^{n+ 80640} * 55 ^{n+ 2923200} * 54$
 $^{n+ 211680} * 53 ^{n+ 1638000} * 52 ^{n-1438920} * 51 ^{n-614880} * 50 ^{n+ 1648080} * 49$
 $^{n-1751400} * 48 ^{n-1027908} * 47 ^{n-4667040} * 46 ^{n-226800} * 45 ^{n+ 1126440} * 44$
 $^{n+ 4667040} * 43 ^{n-5758200} * 42 ^{n+ 1292760} * 41 ^{n+ 428400} * 40 ^{n-6792912} * 39$

$^{n+} 5633460 * 38 ^{n+} 5206320 * 37 ^{n+} 4992120 * 36 ^{n+} 962892 * 35 ^{n-} 3976560 * 34 ^{n-} 4459392 * 33 ^{n-} 3026751 * 32 ^{n-} 4583880 * 31 ^{n+} 326760 * 30 ^{n+} 7567560 * 29 ^{n+} 2298240 * 28 ^{n-} 3583440 * 27 ^{n+} 2406600 * 26 ^{n+} 3008880 * 25 ^{n-} 1724100 * 24 ^{n-} 3227700 * 23 ^{n-} 1088640 * 22 ^{n-} 2449440 * 21 ^{n+} 3524220 * 20 ^{n+} 3402000 * 19 ^{n-} 639660 * 18 ^{n-} 1408470 * 17 ^{n-} 1810116 * 16 ^{n-} 2784600 * 15 ^{n+} 3367350 * 14 ^{n+} 2693880 * 13 ^{n-} 3501288 * 12 ^{n+} 448980 * 11 ^{n+} 1614816 * 10 ^{n+} 269136 * 9 ^{n-} 1496692 * 8 ^{n+} 403704 * 7 ^{n-} 708744 * 6 ^{n+} 708744 * 5 ^{n+} 109584 * 4 ^{n-} 219168 * 3 ^{n+} 40320 * 2 ^{n-}$

$M(n,10)=(1/10!) * (1024^{n-90} * 768^{n+720} * 640^{n+840} * 576^{n+2520} * 544^{n-2520} * 528^{n+1680} * 520^{n-720} * 516^{n+180} * 514^{n-20} * 513^{n-4995} * 512^{n-30240} * 480^{n+31500} * 448^{n+25200} * 432^{n-20160} * 416^{n-50400} * 408^{n+126000} * 400^{n+30240} * 396^{n-30240} * 392^{n-10080} * 390^{n+10080} * 388^{n+1440} * 387^{n-1440} * 386^{n+79920} * 384^{n-151200} * 368^{n+100800} * 360^{n+30240} * 352^{n+201600} * 344^{n+151200} * 340^{n-894600} * 336^{n-151200} * 332^{n-60480} * 330^{n+257040} * 328^{n+60480} * 326^{n+10080} * 325^{n-161280} * 324^{n-10080} * 323^{n+5040} * 322^{n-229320} * 320^{n-302400} * 312^{n-302400} * 308^{n+50400} * 306^{n+611100} * 304^{n-907200} * 300^{n+151200} * 298^{n-10080} * 297^{n+745920} * 296^{n-90720} * 294^{n-30240} * 293^{n+246960} * 292^{n+30240} * 291^{n+90720} * 290^{n+12600} * 289^{n+1276380} * 288^{n-302400} * 284^{n-302400} * 282^{n-50400} * 281^{n+1643040} * 280^{n+201600} * 278^{n+75600} * 277^{n+1234800} * 276^{n-50400} * 275^{n+163800} * 274^{n+50400} * 273^{n-1258740} * 272^{n+453600} * 270^{n-100800} * 269^{n+335160} * 268^{n+50400} * 267^{n+322560} * 266^{n+37800} * 265^{n-3270960} * 264^{n-30240} * 263^{n-54720} * 262^{n-55440} * 261^{n+232920} * 260^{n+90} * 259^{n-1216080} * 258^{n+810} * 257^{n+507390} * 256^{n-302400} * 255^{n+3553200} * 252^{n+907200} * 250^{n+302400} * 249^{n-1764000} * 248^{n-1360800} * 246^{n+1058400} * 244^{n-30240} * 243^{n+604800} * 242^{n-3255000} * 240^{n+378000} * 238^{n-1360800} * 236^{n+1310400} * 234^{n-151200} * 233^{n+630000} * 232^{n+589680} * 231^{n-3326400} * 230^{n+181440} * 229^{n-7801920} * 228^{n-100800} * 226^{n-403200} * 225^{n+3940020} * 224^{n-4032000} * 222^{n+302400} * 221^{n+2368800} * 220^{n-453600} * 219^{n+2116800} * 218^{n-151200} * 217^{n+3704400} * 216^{n+1209600} * 215^{n+1512000} * 214^{n+554400} * 213^{n+1864800} * 212^{n-6380640} * 210^{n-604800} * 209^{n-630000} * 208^{n+453600} * 207^{n+60480} * 206^{n+1058400} * 205^{n+4944240} * 204^{n-2479680} * 202^{n+388080} * 201^{n-3190320} * 200^{n-443520} * 199^{n+9288720} * 198^{n-1512000} * 197^{n+12787740} * 196^{n-6395760} * 195^{n+2968560} * 194^{n+1512000} * 193^{n-1459920} * 192^{n+16480800} * 190^{n+302400} * 189^{n-12474000} * 188^{n+50400} * 187^{n+6804000} * 186^{n+6300000} * 185^{n-4023600} * 184^{n-2192400} * 183^{n+907200} * 182^{n-1738800} * 181^{n-11365200} * 180^{n+604800} * 179^{n+4939200} * 178^{n+7963200} * 177^{n-17829000} * 176^{n-3144960} * 175^{n-31903200} * 174^{n-1844640} * 173^{n+14454720} * 172^{n-1144080} * 171^{n-13960800} * 170^{n-6693120} * 169^{n-16702560} * 168^{n-4898880} * 167^{n-2504880} * 166^{n-10251360} * 165^{n+44336880} * 164^{n+8991360} * 163^{n+7902720} * 162^{n-4989600} * 161^{n-}$

652680*160^n+6980400*159^n+10584000*158^n-756000*157^n-
18804240*156^n+604800*155^n+2721600*154^n+7106400*153^n-
6010200*152^n+13003200*151^n+19933200*150^n+4208400*149^n+1189440*148^n-
6287400*147^n-12398400*146^n+19908000*145^n+8211840*144^n-
50400*143^n+3323040*142^n+15346800*141^n+11241720*140^n+1542240*139^n-
6521760*138^n-4188240*137^n-10111920*136^n-15817440*135^n-3318840*134^n-
17818920*133^n-46982880*132^n-19451160*131^n+23306640*130^n-
55857120*129^n+13130250*128^n-
151200*127^n+47174400*126^n+6199200*125^n+27307350*124^n+36046080*123^n-
9324000*122^n+44200800*121^n-46720800*120^n-7975800*119^n-
35380800*118^n+16616880*117^n+1398600*116^n-49896000*115^n-
68846400*114^n+50218560*113^n+53411400*112^n-
17886960*111^n+24937920*110^n+22604400*109^n-17287200*108^n-
24998400*107^n+66780000*106^n-66462480*105^n+5594400*104^n-
9480240*103^n+36403920*102^n-38707200*101^n-
21268800*100^n+79309440*99^n+41682060*98^n+48875400*97^n-
3773700*96^n+91551600*95^n-86307480*94^n+11913300*93^n-7812000*92^n-
11037600*91^n-150948000*90^n-5796000*89^n-77737800*88^n-
153165600*87^n+113293320*86^n-19971000*85^n+51760800*84^n-
39649680*83^n+191421720*82^n+5766600*81^n+12894420*80^n+59170020*79^n-
96069960*78^n+67687200*77^n-66628800*76^n+80010000*75^n+54647880*74^n-
85024800*73^n-45659880*72^n-60623640*71^n-1169280*70^n-
40017600*69^n+77256900*68^n+102259920*67^n-
7194600*66^n+78441300*65^n+5739573*64^n-79657452*63^n-146786850*62^n-
66729600*61^n-45418800*60^n+3704400*59^n+61941600*58^n-
8769600*57^n+140156100*56^n-
19051200*55^n+57103200*54^n+14565600*53^n+40849200*52^n-35721000*51^n-
26762400*50^n+40458600*49^n-45758790*48^n-24835860*47^n-93912000*46^n-
8626800*45^n+31941000*44^n+106495200*43^n-
102979800*42^n+26523000*41^n+1645560*40^n-
135849840*39^n+94460100*38^n+103798800*37^n+87976980*36^n+12102300*35^n-
70568820*34^n-75754476*33^n-47297355*32^n-
79319100*31^n+16624440*30^n+130977000*29^n+27437130*28^n-
63849240*27^n+34340040*26^n+46592280*25^n-24713640*24^n-44895060*23^n-
15185520*22^n-34167420*21^n+46530540*20^n+47454750*19^n-9799020*18^n-
20085030*17^n-20206180*16^n-33584460*15^n+40398750*14^n+32319000*13^n-
41003160*12^n+5386500*11^n+17368320*10^n+2894720*9^n-
16195620*8^n+4342080*7^n-7036200*6^n+7036200*5^n+1026576*4^n-
2053152*3^n+362880*2^n)