

Common sequences

Name	OEIS ID	closed form	recursive form
	Sequence values		
Naturals	A001477	$a_n = n$	$a_0 = 0; a_n = a_{n-1} + 1$
	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, ...		
Evens	A005843	$a_n = 2n$	$a_0 = 0; a_n = a_{n-1} + 2$
	0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, ...		
Odds	A005408	$a_n = 2n + 1$	$a_0 = 1; a_n = a_{n-1} + 2$
	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, ...		
Squares	A000290	$a_n = n^2$	$a_0 = 0; a_n = a_{n-1} + 2(n - 1) + 1$
	0, 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400, 441, 484, 529, 576, 625, 676, 729, 784, 841, 900, 961, 1024, 1089, 1156, 1225, 1296, 1369, 1444, 1521, 1600, 1681, 1764, 1849, 1936, 2025, 2116, 2209, 2304, 2401, ...		
Cubes	A000578	$a_n = n^3$	$a_0 = 0; a_n = a_{n-1} + 3(n - 1)^2 + 3(n - 1) + 1$
	0, 1, 8, 27, 64, 125, 216, 343, 512, 729, 1000, 1331, 1728, 2197, 2744, 3375, ...		
Fourth powers	A000583	$a_n = n^4$	
	0, 1, 16, 81, 256, 625, 1296, 2401, 4096, 6561, ...		
Fifth powers	A000584	$a_n = n^5$	
	0, 1, 32, 243, 1024, 3125, 7776, 16 807, 32 768, 59 049, ...		
Powers of 2	A000079	$a_n = 2^n$	$a_0 = 1; a_n = 2a_{n-1}$
	1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16 384, 32 768, 65 536, 131 072, 262 144, 524 288, 1 048 576, ...		
Powers of 3	A000244	$a_n = 3^n$	$a_0 = 1; a_n = 3a_{n-1}$
	1, 3, 9, 27, 81, 243, 729, 2187, 6561, 19 683, 59 049, ...		
Powers of 4	A000302	$a_n = 4^n$	$a_0 = 1; a_n = 4a_{n-1}$
	1, 4, 16, 64, 256, 1024, 4096, 16 384, 65 536, 262 144, 1 048 576, ...		
Powers of 5	A000351	$a_n = 5^n$	$a_0 = 1; a_n = 5a_{n-1}$
	1, 5, 25, 125, 625, 3125, 15 625, 78 125, 390 625, 1 953 125, 9 765 625, ...		
Powers of 10	A011557	$a_n = 10^n$	$a_0 = 1; a_n = 10a_{n-1}$
	1, 10, 100, 1000, 10 000, 100 000, 1 000 000, ...		
Powers of 2 minus 1	A000225	$a_n = 2^n - 1$	$a_0 = 0; a_n = a_{n-1} + 2^{n-1}$
	0, 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047, 4095, 8191, 16 383, 32 767, ...		

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Factorials	A000142	$a_n = \prod_{k=1}^n k = n!$	$a_0 = 1; a_n = na_{n-1}$
	1, 1, 2, 6, 24, 120, 720, 5040, 40 320, 362 880, 3 628 800, ...		
Derangements	A000166		$D_0 = 1, D_1 = 0; D_n = (n - 1)(D_{n-1} + D_{n-2})$
	1, 0, 1, 2, 9, 44, 265, 1854, 14 833, 133 496, 1 334 961, ...		
Fibonacci numbers	A000045	$F_n = \frac{\varphi^n - (-\varphi)^{-n}}{\sqrt{5}}; \varphi = \frac{1+\sqrt{5}}{2}$	$F_0 = 0, F_1 = 1; F_n = F_{n-1} + F_{n-2}$
	0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, ...		
Catalan numbers	A000108	$C_n = \frac{(2n)!}{(n+1)!n!}$	$C_0 = 1; C_n = \sum_{k=1}^n C_{k-1}C_{n-k}$
	1, 1, 2, 5, 14, 42, 132, 429, 1430, 4862, 16 796, ...		
Primes	A000040	$p_i, i \geq 1$	
	2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193, 197, 199, 211, 223, 227, 229, 233, 239, 241, 251, 257, 263, 269, 271, 277, 281, 283, 293, 307, 311, 313, 317, 331, 337, 347, 349, 353, 359, 367, 373, 379, 383, 389, 397, 401, 409, 419, 421, 431, 433, 439, 443, 449, 457, 461, 463, 467, 479, 487, 491, 499, 503, 509, 521, 523, 541, 547, 557, 563, 569, 571, 577, 587, 593, 599, 601, 607, 613, 617, 619, 631, 641, 643, 647, 653, 659, 661, 673, 677, 683, 691, 701, 709, 719, 727, 733, 739, 743, 751, 757, 761, 769, 773, 787, 797, 809, 811, 821, 823, 827, 829, 839, 853, 857, 859, 863, 877, 881, 883, 887, 907, 911, 919, 929, 937, 941, 947, 953, 967, 971, 977, 983, 991, 997, ...		
Primes of form $4k + 1$	A002144	$p_i = 4k + 1$	
	5, 13, 17, 29, 37, 41, 53, 61, 73, 89, 97, 101, 109, 113, 137, 149, 157, 173, 181, 193, 197, 229, 233, 241, 257, 269, 277, 281, 293, 313, 317, 337, 349, 353, 373, 389, 397, 401, 409, 421, 433, 449, 457, 461, 509, 521, 541, 557, 569, 577, 593, 601, 613, 617, 641, 653, 661, 673, 677, 701, 709, 733, 757, 761, 769, 773, 797, 809, 821, 829, 853, 857, 877, 881, 929, 937, 941, 953, 977, 997, 1009, 1013, 1021, 1033, 1049, 1061, 1069, 1093, 1097, 1109, 1117, 1129, 1153, 1181, 1193, 1201, 1213, 1217, 1229, 1237, 1249, 1277, 1289, 1297, 1301, 1321, 1361, 1373, 1381, 1409, 1429, 1433, 1453, 1481, 1489, 1493, 1549, 1553, 1597, 1601, 1609, 1613, 1621, 1637, 1657, 1669, 1693, 1697, 1709, 1721, 1733, 1741, 1753, 1777, 1789, 1801, 1861, 1873, 1877, 1889, 1901, 1913, 1933, 1949, 1973, 1993, 1997, 2017, 2029, 2053, 2069, 2081, 2089, 2113, 2129, ...		
Composites	A002808	$a_i > 1, a_i$ not prime	
	4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30, 32, 33, 34, 35, 36, 38, ...		

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Pronic numbers	A002378	$a_n = n(n + 1)$	
	0, 2, 6, 12, 20, 30, 42, 56, 72, 90, 110, 132, 156, 182, 210, 240, 272, 306, 342, 380, 420, 462, 506, 552, 600, 650, 702, 756, 812, 870, 930, 992, 1056, 1122, 1190, 1260, 1332, 1406, 1482, 1560, 1640, 1722, 1806, 1892, 1980, 2070, 2162, 2256, 2352, 2450, ...		
Centered pronic numbers	A001105	$a_n = n(n + 1) + n(n - 1) = 2n^2$	
	0, 2, 8, 18, 32, 50, 72, 98, 128, 162, 200, 242, 288, 338, 392, 450, 512, 578, 648, 722, 800, 882, 968, 1058, 1152, 1250, 1352, 1458, 1568, 1682, 1800, 1922, 2048, 2178, 2312, ...		
Triangular numbers	A000217	$T_n = n(n + 1)/2$	$T_0 = 0; T_n = T_{n-1} + n$
	0, 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105, 120, 136, 153, 171, 190, 210, 231, 253, 276, 300, 325, 351, 378, 406, 435, 465, 496, 528, 561, 595, 630, 666, 703, 741, 780, 820, 861, 903, 946, 990, 1035, 1081, 1128, 1176, 1225, 1275, 1326, 1378, 1431, 1485, 1540, 1596, 1653, 1711, 1770, 1830, 1891, 1953, 2016, 2080, 2145, 2211, 2278, ...		
Tetrahedral numbers	A000292	$a_n = n(n + 1)(n + 2)/6$	$a_0 = 0; a_n = a_{n-1} + n(n + 1)/2$
	0, 1, 4, 10, 20, 35, 56, 84, 120, 165, 220, 286, 364, 455, 560, 680, 816, 969, 1140, 1330, 1540, 1771, 2024, 2300, 2600, 2925, 3276, 3654, 4060, 4495, 4960, 5456, ...		
Square pyramidal numbers	A000330	$a_n = n(n + 1)(2n + 1)/6$	$a_0 = 0; a_n = a_{n-1} + n^2$
	0, 1, 5, 14, 30, 55, 91, 140, 204, 285, 385, 506, 650, 819, 1015, 1240, 1496, 1785, 2109, 2470, 2870, 3311, 3795, 4324, 4900, 5525, ...		
Star numbers and C12	A003154	$a_n = 6n(n - 1) + 1, n \geq 1$	$a_1 = 1; a_n = a_{n-1} + 12(n - 1)$
	1, 13, 37, 73, 121, 181, 253, 337, 433, 541, 661, 793, 937, 1093, 1261, 1441, 1633, 1837, 2053, 2281, 2521, 2773, 3037, 3313, 3601, 3901, 4213, 4537, 4873, 5221, 5581, 5953, 6337, 6733, 7141, 7561, 7993, 8437, 8893, 9361, ...		

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Centered triangular numbers	A005448	$a_n = 3n(n - 1)/2 + 1$	$a_0 = 1; a_n = a_{n-1} + 3n - 3$
	1, 4, 10, 19, 31, 46, 64, 85, 109, 136, 166, 199, 235, 274, 316, 361, 409, 460, 514, 571, 631, 694, 760, 829, 901, 976, 1054, 1135, 1219, 1306, 1396, 1489, 1585, 1684, 1786, 1891, 1999, 2110, 2224, 2341, ...		
Centered square numbers	A001844	$a_n = 2n(n + 1) + 1$	$a_0 = 1; a_n = a_{n-1} + 4n$
	1, 5, 13, 25, 41, 61, 85, 113, 145, 181, 221, 265, 313, 365, 421, 481, 545, 613, 685, 761, 841, 925, 1013, 1105, 1201, 1301, 1405, 1513, 1625, 1741, 1861, 1985, 2113, ...		
Centered pentagonal numbers	A005891	$a_n = (5n^2 + 5n + 2)/2$	$a_0 = 1, a_1 = 6; a_n = 2a_{n-1} - a_{n-2} + 5$
	1, 6, 16, 31, 51, 76, 106, 141, 181, 226, 276, 331, 391, 456, 526, 601, 681, 766, 856, 951, 1051, 1156, 1266, 1381, 1501, 1626, 1756, 1891, 2031, 2176, 2326, 2481, 2641, ...		
Centered hexagonal numbers	A003215	$a_n = 3n(n + 1) + 1$	$a_0 = 1; a_n = a_{n-1} + 6n$
	1, 7, 19, 37, 61, 91, 127, 169, 217, 271, 331, 397, 469, 547, 631, 721, 817, 919, 1027, 1141, 1261, 1387, 1519, 1657, 1801, 1951, 2107, 2269, 2437, 2611, 2791, 2977, 3169, ...		
Centered heptagonal numbers	A069099	$a_n = (7n^2 - 7n + 2)/2$	
	1, 1, 8, 22, 43, 71, 106, 148, 197, 253, 316, 386, 463, 547, 638, 736, 841, 953, 1072, 1198, 1331, 1471, 1618, 1772, 1933, 2101, 2276, 2458, 2647, 2843, ...		
Centered octagonal numbers	A016754	$a_n = (2n + 1)^2$	
	1, 9, 25, 49, 81, 121, 169, 225, 289, 361, 441, 529, 625, 729, 841, 961, 1089, 1225, 1369, 1521, 1681, 1849, 2025, 2209, 2401, 2601, 2809, 3025, 3249, 3481, ...		
Centered nonagonal numbers	A060544		
	1, 1, 10, 28, 55, 91, 136, 190, 253, 325, 406, 496, 595, 703, 820, 946, 1081, 1225, 1378, 1540, 1711, 1891, 2080, 2278, 2485, 2701, 2926, 3160, 3403, 3655, ...		
Centered decagonal numbers	A062786		
	1, 1, 11, 31, 61, 101, 151, 211, 281, 361, 451, 551, 661, 781, 911, 1051, 1201, 1361, 1531, 1711, 1901, 2101, 2311, 2531, 2761, 3001, 3251, 3511, 3781, 4061, ...		
Centered hendecagonal numbers	A069125		
	1, 1, 12, 34, 67, 111, 166, 232, 309, 397, 496, 606, 727, 859, 1002, 1156, 1321, 1497, 1684, 1882, 2091, 2311, 2542, 2784, 3037, 3301, 3576, 3862, 4159, 4467, ...		
Star numbers and C12	A003154	$a_n = 6n(n - 1) + 1, n \geq 1$	$a_1 = 1; a_n = a_{n-1} + 12(n - 1)$
	1, 13, 37, 73, 121, 181, 253, 337, 433, 541, 661, 793, 937, 1093, 1261, 1441, 1633, 1837, 2053, 2281, 2521, 2773, 3037, 3313, 3601, 3901, 4213, 4537, 4873, 5221, 5581, 5953, 6337, 6733, 7141, 7561, 7993, 8437, 8893, 9361, ...		