

| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 2 | 0 | 1 | 0.9801 | 0.9025 | 0.8100 | 0.7225 | 0.6400 | 0.5625 | 0.4900 | 0.4444 | 0.4225 | 0.3600 | 0.3025 | 0.2601 | 0.2500 |
| | 1 | 2 | 0.0198 | 0.0950 | 0.1800 | 0.2550 | 0.3200 | 0.3750 | 0.4200 | 0.4444 | 0.4550 | 0.4800 | 0.4950 | 0.4998 | 0.5000 |
| | 2 | 1 | 0.0001 | 0.0025 | 0.0100 | 0.0225 | 0.0400 | 0.0625 | 0.0900 | 0.1111 | 0.1225 | 0.1600 | 0.2025 | 0.2401 | 0.2500 |
| 3 | 0 | 1 | 0.9703 | 0.8574 | 0.7290 | 0.6141 | 0.5120 | 0.4219 | 0.3430 | 0.2963 | 0.2746 | 0.2160 | 0.1664 | 0.1327 | 0.1250 |
| | 1 | 3 | 0.0294 | 0.1354 | 0.2430 | 0.3251 | 0.3840 | 0.4219 | 0.4410 | 0.4444 | 0.4436 | 0.4320 | 0.4084 | 0.3823 | 0.3750 |
| | 2 | 3 | 0.0003 | 0.0071 | 0.0270 | 0.0574 | 0.0960 | 0.1406 | 0.1890 | 0.2222 | 0.2389 | 0.2880 | 0.3341 | 0.3674 | 0.3750 |
| | 3 | 1 | | 0.0001 | 0.0010 | 0.0034 | 0.0080 | 0.0156 | 0.0270 | 0.0370 | 0.0429 | 0.0640 | 0.0911 | 0.1176 | 0.1250 |
| 4 | 0 | 1 | 0.9606 | 0.8145 | 0.6561 | 0.5220 | 0.4096 | 0.3164 | 0.2401 | 0.1975 | 0.1785 | 0.1296 | 0.0915 | 0.0677 | 0.0625 |
| | 1 | 4 | 0.0388 | 0.1715 | 0.2916 | 0.3685 | 0.4096 | 0.4219 | 0.4116 | 0.3951 | 0.3845 | 0.3456 | 0.2995 | 0.2600 | 0.2500 |
| | 2 | 6 | 0.0006 | 0.0135 | 0.0486 | 0.0975 | 0.1536 | 0.2109 | 0.2646 | 0.2963 | 0.3105 | 0.3456 | 0.3675 | 0.3747 | 0.3750 |
| | 3 | 4 | | 0.0005 | 0.0036 | 0.0115 | 0.0256 | 0.0469 | 0.0756 | 0.0988 | 0.1115 | 0.1536 | 0.2005 | 0.2400 | 0.2500 |
| | 4 | 1 | | | 0.0001 | 0.0005 | 0.0016 | 0.0039 | 0.0081 | 0.0123 | 0.0150 | 0.0256 | 0.0410 | 0.0576 | 0.0625 |
| 5 | 0 | 1 | 0.9510 | 0.7738 | 0.5905 | 0.4437 | 0.3277 | 0.2373 | 0.1681 | 0.1317 | 0.1160 | 0.0778 | 0.0503 | 0.0345 | 0.0313 |
| | 1 | 5 | 0.0480 | 0.2036 | 0.3281 | 0.3915 | 0.4096 | 0.3955 | 0.3601 | 0.3292 | 0.3124 | 0.2592 | 0.2059 | 0.1657 | 0.1563 |
| | 2 | 10 | 0.0010 | 0.0214 | 0.0729 | 0.1382 | 0.2048 | 0.2637 | 0.3087 | 0.3292 | 0.3364 | 0.3456 | 0.3369 | 0.3185 | 0.3125 |
| | 3 | 10 | | 0.0011 | 0.0081 | 0.0244 | 0.0512 | 0.0879 | 0.1323 | 0.1646 | 0.1811 | 0.2304 | 0.2757 | 0.3060 | 0.3125 |
| | 4 | 5 | | | 0.0005 | 0.0022 | 0.0064 | 0.0146 | 0.0284 | 0.0412 | 0.0488 | 0.0768 | 0.1128 | 0.1470 | 0.1563 |
| | 5 | 1 | | | | 0.0001 | 0.0003 | 0.0010 | 0.0024 | 0.0041 | 0.0053 | 0.0102 | 0.0185 | 0.0282 | 0.0313 |
| 6 | 0 | 1 | 0.9415 | 0.7351 | 0.5314 | 0.3771 | 0.2621 | 0.1780 | 0.1176 | 0.0878 | 0.0754 | 0.0467 | 0.0277 | 0.0176 | 0.0156 |
| | 1 | 6 | 0.0571 | 0.2321 | 0.3543 | 0.3993 | 0.3932 | 0.3560 | 0.3025 | 0.2634 | 0.2437 | 0.1866 | 0.1359 | 0.1014 | 0.0938 |
| | 2 | 15 | 0.0014 | 0.0305 | 0.0984 | 0.1762 | 0.2458 | 0.2966 | 0.3241 | 0.3292 | 0.3280 | 0.3110 | 0.2780 | 0.2436 | 0.2344 |
| | 3 | 20 | | 0.0021 | 0.0146 | 0.0415 | 0.0819 | 0.1318 | 0.1852 | 0.2195 | 0.2355 | 0.2765 | 0.3032 | 0.3121 | 0.3125 |
| | 4 | 15 | | 0.0001 | 0.0012 | 0.0055 | 0.0154 | 0.0330 | 0.0595 | 0.0823 | 0.0951 | 0.1382 | 0.1861 | 0.2249 | 0.2344 |
| | 5 | 6 | | | 0.0001 | 0.0004 | 0.0015 | 0.0044 | 0.0102 | 0.0165 | 0.0205 | 0.0369 | 0.0609 | 0.0864 | 0.0938 |
| | 6 | 1 | | | | | 0.0001 | 0.0002 | 0.0007 | 0.0014 | 0.0018 | 0.0041 | 0.0083 | 0.0138 | 0.0156 |
| 7 | 0 | 1 | 0.9321 | 0.6983 | 0.4783 | 0.3206 | 0.2097 | 0.1335 | 0.0824 | 0.0585 | 0.0490 | 0.0280 | 0.0152 | 0.0090 | 0.0078 |
| | 1 | 7 | 0.0659 | 0.2573 | 0.3720 | 0.3960 | 0.3670 | 0.3115 | 0.2471 | 0.2049 | 0.1848 | 0.1306 | 0.0872 | 0.0604 | 0.0547 |
| | 2 | 21 | 0.0020 | 0.0406 | 0.1240 | 0.2097 | 0.2753 | 0.3115 | 0.3177 | 0.3073 | 0.2985 | 0.2613 | 0.2140 | 0.1740 | 0.1641 |
| | 3 | 35 | | 0.0036 | 0.0230 | 0.0617 | 0.1147 | 0.1730 | 0.2269 | 0.2561 | 0.2679 | 0.2903 | 0.2918 | 0.2786 | 0.2734 |
| | 4 | 35 | | 0.0002 | 0.0026 | 0.0109 | 0.0287 | 0.0577 | 0.0972 | 0.1280 | 0.1442 | 0.1935 | 0.2388 | 0.2676 | 0.2734 |
| | 5 | 21 | | | 0.0002 | 0.0012 | 0.0043 | 0.0115 | 0.0250 | 0.0384 | 0.0466 | 0.0774 | 0.1172 | 0.1543 | 0.1641 |
| | 6 | 7 | | | | 0.0001 | 0.0004 | 0.0013 | 0.0036 | 0.0064 | 0.0084 | 0.0172 | 0.0320 | 0.0494 | 0.0547 |
| | 7 | 1 | | | | | | 0.0001 | 0.0002 | 0.0005 | 0.0006 | 0.0016 | 0.0037 | 0.0068 | 0.0078 |
| 8 | 0 | 1 | 0.9227 | 0.6634 | 0.4305 | 0.2725 | 0.1678 | 0.1001 | 0.0576 | 0.0390 | 0.0319 | 0.0168 | 0.0084 | 0.0046 | 0.0039 |
| | 1 | 8 | 0.0746 | 0.2793 | 0.3826 | 0.3847 | 0.3355 | 0.2670 | 0.1977 | 0.1561 | 0.1373 | 0.0896 | 0.0548 | 0.0352 | 0.0313 |
| | 2 | 28 | 0.0026 | 0.0515 | 0.1488 | 0.2376 | 0.2936 | 0.3115 | 0.2965 | 0.2731 | 0.2587 | 0.2090 | 0.1569 | 0.1183 | 0.1094 |
| | 3 | 56 | 0.0001 | 0.0054 | 0.0331 | 0.0839 | 0.1468 | 0.2076 | 0.2541 | 0.2731 | 0.2786 | 0.2787 | 0.2568 | 0.2273 | 0.2188 |
| | 4 | 70 | | 0.0004 | 0.0046 | 0.0185 | 0.0459 | 0.0865 | 0.1361 | 0.1707 | 0.1875 | 0.2322 | 0.2627 | 0.2730 | 0.2734 |
| | 5 | 56 | | | 0.0004 | 0.0026 | 0.0092 | 0.0231 | 0.0467 | 0.0683 | 0.0808 | 0.1239 | 0.1719 | 0.2098 | 0.2188 |
| | 6 | 28 | | | | 0.0002 | 0.0011 | 0.0038 | 0.0100 | 0.0171 | 0.0217 | 0.0413 | 0.0703 | 0.1008 | 0.1094 |
| | 7 | 8 | | | | | 0.0001 | 0.0004 | 0.0012 | 0.0024 | 0.0033 | 0.0079 | 0.0164 | 0.0277 | 0.0313 |
| | 8 | 1 | | | | | | | 0.0001 | 0.0002 | 0.0002 | 0.0007 | 0.0017 | 0.0033 | 0.0039 |
| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 9 | 0 | 1 | 0.9135 | 0.6302 | 0.3874 | 0.2316 | 0.1342 | 0.0751 | 0.0404 | 0.0260 | 0.0207 | 0.0101 | 0.0046 | 0.0023 | 0.0020 |
| | 1 | 9 | 0.0830 | 0.2985 | 0.3874 | 0.3679 | 0.3020 | 0.2253 | 0.1556 | 0.1171 | 0.1004 | 0.0605 | 0.0339 | 0.0202 | 0.0176 |
| | 2 | 36 | 0.0034 | 0.0629 | 0.1722 | 0.2597 | 0.3020 | 0.3003 | 0.2668 | 0.2341 | 0.2162 | 0.1612 | 0.1110 | 0.0776 | 0.0703 |
| | 3 | 84 | 0.0001 | 0.0077 | 0.0446 | 0.1069 | 0.1762 | 0.2336 | 0.2668 | 0.2731 | 0.2716 | 0.2508 | 0.2119 | 0.1739 | 0.1641 |
| | 4 | 126 | | 0.0006 | 0.0074 | 0.0283 | 0.0661 | 0.1168 | 0.1715 | 0.2048 | 0.2194 | 0.2508 | 0.2600 | 0.2506 | 0.2461 |
| | 5 | 126 | | | 0.0008 | 0.0050 | 0.0165 | 0.0389 | 0.0735 | 0.1024 | 0.1181 | 0.1672 | 0.2128 | 0.2408 | 0.2461 |
| | 6 | 84 | | | 0.0001 | 0.0006 | 0.0028 | 0.0087 | 0.0210 | 0.0341 | 0.0424 | 0.0743 | 0.1160 | 0.1542 | 0.1641 |
| | 7 | 36 | | | | 0.0000 | 0.0003 | 0.0012 | 0.0039 | 0.0073 | 0.0098 | 0.0212 | 0.0407 | 0.0635 | 0.0703 |
| | 8 | 9 | | | | | | 0.0001 | 0.0004 | 0.0009 | 0.0013 | 0.0035 | 0.0083 | 0.0153 | 0.0176 |
| | 9 | 1 | | | | | | | | 0.0001 | 0.0001 | 0.0003 | 0.0008 | 0.0016 | 0.0020 |
| 10 | 0 | 1 | 0.9044 | 0.5987 | 0.3487 | 0.1969 | 0.1074 | 0.0563 | 0.0282 | 0.0173 | 0.0135 | 0.0060 | 0.0025 | 0.0012 | 0.0010 |
| | 1 | 10 | 0.0914 | 0.3151 | 0.3874 | 0.3474 | 0.2684 | 0.1877 | 0.1211 | 0.0867 | 0.0725 | 0.0403 | 0.0207 | 0.0114 | 0.0098 |
| | 2 | 45 | 0.0042 | 0.0746 | 0.1937 | 0.2759 | 0.3020 | 0.2816 | 0.2335 | 0.1951 | 0.1757 | 0.1209 | 0.0763 | 0.0494 | 0.0439 |
| | 3 | 120 | 0.0001 | 0.0105 | 0.0574 | 0.1298 | 0.2013 | 0.2503 | 0.2668 | 0.2601 | 0.2522 | 0.2150 | 0.1665 | 0.1267 | 0.1172 |
| | 4 | 210 | | 0.0010 | 0.0112 | 0.0401 | 0.0881 | 0.1460 | 0.2001 | 0.2276 | 0.2377 | 0.2508 | 0.2384 | 0.2130 | 0.2051 |
| | 5 | 252 | | 0.0001 | 0.0015 | 0.0085 | 0.0264 | 0.0584 | 0.1029 | 0.1366 | 0.1536 | 0.2007 | 0.2340 | 0.2456 | 0.2461 |
| | 6 | 210 | | | 0.0001 | 0.0012 | 0.0055 | 0.0162 | 0.0368 | 0.0569 | 0.0689 | 0.1115 | 0.1596 | 0.1966 | 0.2051 |
| | 7 | 120 | | | | 0.0001 | 0.0008 | 0.0031 | 0.0090 | 0.0163 | 0.0212 | 0.0425 | 0.0746 | 0.1080 | 0.1172 |
| | 8 | 45 | | | | | 0.0001 | 0.0004 | 0.0014 | 0.0030 | 0.0043 | 0.0106 | 0.0229 | 0.0389 | 0.0439 |
| | 9 | 10 | | | | | | | 0.0001 | 0.0003 | 0.0005 | 0.0016 | 0.0042 | 0.0083 | 0.0098 |
| | 10 | 1 | | | | | | | | | | 0.0001 | 0.0003 | 0.0008 | 0.0010 |
| 11 | 0 | 1 | 0.8953 | 0.5688 | 0.3138 | 0.1673 | 0.0859 | 0.0422 | 0.0198 | 0.0116 | 0.0088 | 0.0036 | 0.0014 | 0.0006 | 0.0005 |
| | 1 | 11 | 0.0995 | 0.3293 | 0.3835 | 0.3248 | 0.2362 | 0.1549 | 0.0932 | 0.0636 | 0.0518 | 0.0266 | 0.0125 | 0.0064 | 0.0054 |
| | 2 | 55 | 0.0050 | 0.0867 | 0.2131 | 0.2866 | 0.2953 | 0.2581 | 0.1998 | 0.1590 | 0.1395 | 0.0887 | 0.0513 | 0.0308 | 0.0269 |
| | 3 | 165 | 0.0002 | 0.0137 | 0.0710 | 0.1517 | 0.2215 | 0.2581 | 0.2568 | 0.2385 | 0.2254 | 0.1774 | 0.1259 | 0.0888 | 0.0806 |
| | 4 | 330 | | 0.0014 | 0.0158 | 0.0536 | 0.1107 | 0.1721 | 0.2201 | 0.2385 | 0.2428 | 0.2365 | 0.2060 | 0.1707 | 0.1611 |
| | 5 | 462 | | 0.0001 | 0.0025 | 0.0132 | 0.0388 | 0.0803 | 0.1321 | 0.1669 | 0.1830 | 0.2207 | 0.2360 | 0.2296 | 0.2256 |
| | 6 | 462 | | | 0.0003 | 0.0023 | 0.0097 | 0.0268 | 0.0566 | 0.0835 | 0.0985 | 0.1471 | 0.1931 | 0.2206 | 0.2256 |
| | 7 | 330 | | | | 0.0003 | 0.0017 | 0.0064 | 0.0173 | 0.0298 | 0.0379 | 0.0701 | 0.1128 | 0.1514 | 0.1611 |
| | 8 | 165 | | | | | 0.0002 | 0.0011 | 0.0037 | 0.0075 | 0.0102 | 0.0234 | 0.0462 | 0.0727 | 0.0806 |
| | 9 | 55 | | | | | | 0.0001 | 0.0005 | 0.0012 | 0.0018 | 0.0052 | 0.0126 | 0.0233 | 0.0269 |
| | 10 | 11 | | | | | | | 0.0000 | 0.0001 | 0.0002 | 0.0007 | 0.0021 | 0.0045 | 0.0054 |
| | 11 | 1 | | | | | | | | | | 0.0000 | 0.0002 | 0.0004 | 0.0005 |
| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 12 | 0 | 1 | 0.8864 | 0.5404 | 0.2824 | 0.1422 | 0.0687 | 0.0317 | 0.0138 | 0.0077 | 0.0057 | 0.0022 | 0.0008 | 0.0003 | 0.0002 |
| | 1 | 12 | 0.1074 | 0.3413 | 0.3766 | 0.3012 | 0.2062 | 0.1267 | 0.0712 | 0.0462 | 0.0368 | 0.0174 | 0.0075 | 0.0036 | 0.0029 |
| | 2 | 66 | 0.0060 | 0.0988 | 0.2301 | 0.2924 | 0.2835 | 0.2323 | 0.1678 | 0.1272 | 0.1088 | 0.0639 | 0.0339 | 0.0189 | 0.0161 |
| | 3 | 220 | 0.0002 | 0.0173 | 0.0852 | 0.1720 | 0.2362 | 0.2581 | 0.2397 | 0.2120 | 0.1954 | 0.1419 | 0.0923 | 0.0604 | 0.0537 |
| | 4 | 495 | | 0.0021 | 0.0213 | 0.0683 | 0.1329 | 0.1936 | 0.2311 | 0.2385 | 0.2367 | 0.2128 | 0.1700 | 0.1306 | 0.1208 |
| | 5 | 792 | | 0.0002 | 0.0038 | 0.0193 | 0.0532 | 0.1032 | 0.1585 | 0.1908 | 0.2039 | 0.2270 | 0.2225 | 0.2008 | 0.1934 |
| | 6 | 924 | | | 0.0005 | 0.0040 | 0.0155 | 0.0401 | 0.0792 | 0.1113 | 0.1281 | 0.1766 | 0.2124 | 0.2250 | 0.2256 |
| | 7 | 792 | | | 0.0000 | 0.0006 | 0.0033 | 0.0115 | 0.0291 | 0.0477 | 0.0591 | 0.1009 | 0.1489 | 0.1853 | 0.1934 |
| | 8 | 495 | | | | 0.0001 | 0.0005 | 0.0024 | 0.0078 | 0.0149 | 0.0199 | 0.0420 | 0.0762 | 0.1113 | 0.1208 |
| | 9 | 220 | | | | | 0.0001 | 0.0004 | 0.0015 | 0.0033 | 0.0048 | 0.0125 | 0.0277 | 0.0475 | 0.0537 |
| | 10 | 66 | | | | | | | 0.0002 | 0.0005 | 0.0008 | 0.0025 | 0.0068 | 0.0137 | 0.0161 |
| | 11 | 12 | | | | | | | | 0.0000 | 0.0001 | 0.0003 | 0.0010 | 0.0024 | 0.0029 |
| | 12 | 1 | | | | | | | | | | | 0.0001 | 0.0002 | 0.0002 |
| 13 | 0 | 1 | 0.8775 | 0.5133 | 0.2542 | 0.1209 | 0.0550 | 0.0238 | 0.0097 | 0.0051 | 0.0037 | 0.0013 | 0.0004 | 0.0002 | 0.0001 |
| | 1 | 13 | 0.1152 | 0.3512 | 0.3672 | 0.2774 | 0.1787 | 0.1029 | 0.0540 | 0.0334 | 0.0259 | 0.0113 | 0.0045 | 0.0020 | 0.0016 |
| | 2 | 78 | 0.0070 | 0.1109 | 0.2448 | 0.2937 | 0.2680 | 0.2059 | 0.1388 | 0.1002 | 0.0836 | 0.0453 | 0.0220 | 0.0114 | 0.0095 |
| | 3 | 286 | 0.0003 | 0.0214 | 0.0997 | 0.1900 | 0.2457 | 0.2517 | 0.2181 | 0.1837 | 0.1651 | 0.1107 | 0.0660 | 0.0401 | 0.0349 |
| | 4 | 715 | | 0.0028 | 0.0277 | 0.0838 | 0.1535 | 0.2097 | 0.2337 | 0.2296 | 0.2222 | 0.1845 | 0.1350 | 0.0962 | 0.0873 |
| | 5 | 1287 | | 0.0003 | 0.0055 | 0.0266 | 0.0691 | 0.1258 | 0.1803 | 0.2067 | 0.2154 | 0.2214 | 0.1989 | 0.1664 | 0.1571 |
| | 6 | 1716 | | | 0.0008 | 0.0063 | 0.0230 | 0.0559 | 0.1030 | 0.1378 | 0.1546 | 0.1968 | 0.2169 | 0.2131 | 0.2095 |
| | 7 | 1716 | | | 0.0001 | 0.0011 | 0.0058 | 0.0186 | 0.0442 | 0.0689 | 0.0833 | 0.1312 | 0.1775 | 0.2048 | 0.2095 |
| | 8 | 1287 | | | | 0.0001 | 0.0011 | 0.0047 | 0.0142 | 0.0258 | 0.0336 | 0.0656 | 0.1089 | 0.1476 | 0.1571 |
| | 9 | 715 | | | | | 0.0001 | 0.0009 | 0.0034 | 0.0072 | 0.0101 | 0.0243 | 0.0495 | 0.0788 | 0.0873 |
| | 10 | 286 | | | | | | 0.0001 | 0.0006 | 0.0014 | 0.0022 | 0.0065 | 0.0162 | 0.0303 | 0.0349 |
| | 11 | 78 | | | | | | | 0.0001 | 0.0002 | 0.0003 | 0.0012 | 0.0036 | 0.0079 | 0.0095 |
| | 12 | 13 | | | | | | | | | | 0.0001 | 0.0005 | 0.0013 | 0.0016 |
| | 13 | 1 | | | | | | | | | | | | 0.0001 | 0.0001 |
| 14 | 0 | 1 | 0.8687 | 0.4877 | 0.2288 | 0.1028 | 0.0440 | 0.0178 | 0.0068 | 0.0034 | 0.0024 | 0.0008 | 0.0002 | 0.0001 | 0.0001 |
| | 1 | 14 | 0.1229 | 0.3593 | 0.3559 | 0.2539 | 0.1539 | 0.0832 | 0.0407 | 0.0240 | 0.0181 | 0.0073 | 0.0027 | 0.0011 | 0.0009 |
| | 2 | 91 | 0.0081 | 0.1229 | 0.2570 | 0.2912 | 0.2501 | 0.1802 | 0.1134 | 0.0779 | 0.0634 | 0.0317 | 0.0141 | 0.0068 | 0.0056 |
| | 3 | 364 | 0.0003 | 0.0259 | 0.1142 | 0.2056 | 0.2501 | 0.2402 | 0.1943 | 0.1559 | 0.1366 | 0.0845 | 0.0462 | 0.0260 | 0.0222 |
| | 4 | 1001 | | 0.0037 | 0.0349 | 0.0998 | 0.1720 | 0.2202 | 0.2290 | 0.2143 | 0.2022 | 0.1549 | 0.1040 | 0.0687 | 0.0611 |
| | 5 | 2002 | | 0.0004 | 0.0078 | 0.0352 | 0.0860 | 0.1468 | 0.1963 | 0.2143 | 0.2178 | 0.2066 | 0.1701 | 0.1320 | 0.1222 |
| | 6 | 3003 | | | 0.0013 | 0.0093 | 0.0322 | 0.0734 | 0.1262 | 0.1607 | 0.1759 | 0.2066 | 0.2088 | 0.1902 | 0.1833 |
| | 7 | 3431 | | | 0.0002 | 0.0019 | 0.0092 | 0.0280 | 0.0618 | 0.0918 | 0.1082 | 0.1574 | 0.1952 | 0.2088 | 0.2094 |
| | 8 | 3003 | | | | 0.0003 | 0.0020 | 0.0082 | 0.0232 | 0.0402 | 0.0510 | 0.0918 | 0.1398 | 0.1756 | 0.1833 |
| | 9 | 2002 | | | | | 0.0003 | 0.0018 | 0.0066 | 0.0134 | 0.0183 | 0.0408 | 0.0762 | 0.1125 | 0.1222 |
| | 10 | 1001 | | | | | 0.0000 | 0.0003 | 0.0014 | 0.0033 | 0.0049 | 0.0136 | 0.0312 | 0.0540 | 0.0611 |
| | 11 | 364 | | | | | | | 0.0002 | 0.0006 | 0.0010 | 0.0033 | 0.0093 | 0.0189 | 0.0222 |
| | 12 | 91 | | | | | | | 0.0001 | 0.0001 | 0.0005 | 0.0019 | 0.0045 | 0.0056 | |
| | 13 | 14 | | | | | | | | | 0.0001 | 0.0002 | 0.0007 | 0.0009 | |
| | 14 | 1 | | | | | | | | | | | | 0.0000 | 0.0001 |
| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 15 | 0 | 1 | 0.8601 | 0.4633 | 0.2059 | 0.0874 | 0.0352 | 0.0134 | 0.0047 | 0.0023 | 0.0016 | 0.0005 | 0.0001 | 0.0000 | |
| | 1 | 15 | 0.1303 | 0.3658 | 0.3432 | 0.2312 | 0.1319 | 0.0668 | 0.0305 | 0.0171 | 0.0126 | 0.0047 | 0.0016 | 0.0006 | 0.0005 |
| | 2 | 105 | 0.0092 | 0.1348 | 0.2669 | 0.2856 | 0.2309 | 0.1559 | 0.0916 | 0.0599 | 0.0476 | 0.0219 | 0.0090 | 0.0040 | 0.0032 |
| | 3 | 455 | 0.0004 | 0.0307 | 0.1285 | 0.2184 | 0.2501 | 0.2252 | 0.1700 | 0.1299 | 0.1110 | 0.0634 | 0.0318 | 0.0166 | 0.0139 |
| | 4 | 1365 | | 0.0049 | 0.0428 | 0.1156 | 0.1876 | 0.2252 | 0.2186 | 0.1948 | 0.1792 | 0.1268 | 0.0780 | 0.0478 | 0.0417 |
| | 5 | 3003 | | 0.0006 | 0.0105 | 0.0449 | 0.1032 | 0.1651 | 0.2061 | 0.2143 | 0.2123 | 0.1859 | 0.1404 | 0.1010 | 0.0916 |
| | 6 | 5005 | | 0.0000 | 0.0019 | 0.0132 | 0.0430 | 0.0917 | 0.1472 | 0.1786 | 0.1906 | 0.2066 | 0.1914 | 0.1617 | 0.1527 |
| | 7 | 6435 | | | 0.0003 | 0.0030 | 0.0138 | 0.0393 | 0.0811 | 0.1148 | 0.1319 | 0.1771 | 0.2013 | 0.1997 | 0.1964 |
| | 8 | 6435 | | | | 0.0005 | 0.0035 | 0.0131 | 0.0348 | 0.0574 | 0.0710 | 0.1181 | 0.1647 | 0.1919 | 0.1964 |
| | 9 | 5005 | | | | 0.0001 | 0.0007 | 0.0034 | 0.0116 | 0.0223 | 0.0298 | 0.0612 | 0.1048 | 0.1434 | 0.1527 |
| | 10 | 3003 | | | | | 0.0001 | 0.0007 | 0.0030 | 0.0067 | 0.0096 | 0.0245 | 0.0515 | 0.0827 | 0.0916 |
| | 11 | 1365 | | | | | | 0.0001 | 0.0006 | 0.0015 | 0.0024 | 0.0074 | 0.0191 | 0.0361 | 0.0417 |
| | 12 | 455 | | | | | | | 0.0001 | 0.0003 | 0.0004 | 0.0016 | 0.0052 | 0.0116 | 0.0139 |
| | 13 | 105 | | | | | | | | | 0.0001 | 0.0003 | 0.0010 | 0.0026 | 0.0032 |
| | 14 | 15 | | | | | | | | | | | 0.0001 | 0.0004 | 0.0005 |
| | 15 | 1 | | | | | | | | | | | | | |
| 16 | 0 | 1 | 0.8515 | 0.4401 | 0.1853 | 0.0743 | 0.0281 | 0.0100 | 0.0033 | 0.0015 | 0.0010 | 0.0003 | 0.0001 | | |
| | 1 | 16 | 0.1376 | 0.3706 | 0.3294 | 0.2097 | 0.1126 | 0.0535 | 0.0228 | 0.0122 | 0.0087 | 0.0030 | 0.0009 | 0.0003 | 0.0002 |
| | 2 | 120 | 0.0104 | 0.1463 | 0.2745 | 0.2775 | 0.2111 | 0.1336 | 0.0732 | 0.0457 | 0.0353 | 0.0150 | 0.0056 | 0.0023 | 0.0018 |
| | 3 | 560 | 0.0005 | 0.0359 | 0.1423 | 0.2285 | 0.2463 | 0.2079 | 0.1465 | 0.1066 | 0.0888 | 0.0468 | 0.0215 | 0.0104 | 0.0085 |
| | 4 | 1820 | | 0.0061 | 0.0514 | 0.1311 | 0.2001 | 0.2252 | 0.2040 | 0.1732 | 0.1553 | 0.1014 | 0.0572 | 0.0325 | 0.0278 |
| | 5 | 4368 | | 0.0008 | 0.0137 | 0.0555 | 0.1201 | 0.1802 | 0.2099 | 0.2078 | 0.2008 | 0.1623 | 0.1123 | 0.0749 | 0.0667 |
| | 6 | 8008 | | 0.0001 | 0.0028 | 0.0180 | 0.0550 | 0.1101 | 0.1649 | 0.1905 | 0.1982 | 0.1983 | 0.1684 | 0.1319 | 0.1222 |
| | 7 | 11 439 | | | 0.0004 | 0.0045 | 0.0197 | 0.0524 | 0.1010 | 0.1361 | 0.1524 | 0.1889 | 0.1969 | 0.1811 | 0.1745 |
| | 8 | 12 868 | | | 0.0001 | 0.0009 | 0.0055 | 0.0197 | 0.0487 | 0.0765 | 0.0923 | 0.1416 | 0.1812 | 0.1957 | 0.1964 |
| | 9 | 11 438 | | | | 0.0001 | 0.0012 | 0.0058 | 0.0185 | 0.0340 | 0.0442 | 0.0839 | 0.1318 | 0.1671 | 0.1745 |
| | 10 | 8007 | | | | | 0.0002 | 0.0014 | 0.0056 | 0.0119 | 0.0167 | 0.0392 | 0.0755 | 0.1124 | 0.1222 |
| | 11 | 4367 | | | | | | 0.0002 | 0.0013 | 0.0032 | 0.0049 | 0.0142 | 0.0337 | 0.0589 | 0.0666 |
| | 12 | 1820 | | | | | | | 0.0002 | 0.0007 | 0.0011 | 0.0040 | 0.0115 | 0.0236 | 0.0278 |
| | 13 | 560 | | | | | | | | 0.0001 | 0.0002 | 0.0008 | 0.0029 | 0.0070 | 0.0085 |
| | 14 | 120 | | | | | | | | | | 0.0001 | 0.0005 | 0.0014 | 0.0018 |
| | 15 | 16 | | | | | | | | | | | 0.0001 | 0.0002 | 0.0002 |
| | 16 | 1 | | | | | | | | | | | | | |
| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 17 | 0 | 1 | 0.8429 | 0.4181 | 0.1668 | 0.0631 | 0.0225 | 0.0075 | 0.0023 | 0.0010 | 0.0007 | 0.0002 | 0.0000 | | |
| | 1 | 17 | 0.1447 | 0.3741 | 0.3150 | 0.1893 | 0.0957 | 0.0426 | 0.0169 | 0.0086 | 0.0060 | 0.0019 | 0.0005 | 0.0002 | 0.0001 |
| | 2 | 136 | 0.0117 | 0.1575 | 0.2800 | 0.2673 | 0.1914 | 0.1136 | 0.0581 | 0.0345 | 0.0260 | 0.0102 | 0.0035 | 0.0013 | 0.0010 |
| | 3 | 680 | 0.0006 | 0.0415 | 0.1556 | 0.2359 | 0.2393 | 0.1893 | 0.1245 | 0.0863 | 0.0701 | 0.0341 | 0.0144 | 0.0064 | 0.0052 |
| | 4 | 2380 | | 0.0076 | 0.0605 | 0.1457 | 0.2093 | 0.2209 | 0.1868 | 0.1510 | 0.1320 | 0.0796 | 0.0411 | 0.0217 | 0.0182 |
| | 5 | 6188 | | 0.0010 | 0.0175 | 0.0668 | 0.1361 | 0.1914 | 0.2081 | 0.1963 | 0.1849 | 0.1379 | 0.0875 | 0.0541 | 0.0472 |
| | 6 | 12376 | | 0.0001 | 0.0039 | 0.0236 | 0.0680 | 0.1276 | 0.1784 | 0.1963 | 0.1991 | 0.1839 | 0.1432 | 0.1040 | 0.0944 |
| | 7 | 19447 | | | 0.0007 | 0.0065 | 0.0267 | 0.0668 | 0.1201 | 0.1542 | 0.1684 | 0.1927 | 0.1841 | 0.1570 | 0.1484 |
| | 8 | 24307 | | | 0.0001 | 0.0014 | 0.0084 | 0.0278 | 0.0644 | 0.0964 | 0.1134 | 0.1605 | 0.1882 | 0.1886 | 0.1854 |
| | 9 | 24306 | | | | 0.0003 | 0.0021 | 0.0093 | 0.0276 | 0.0482 | 0.0610 | 0.1070 | 0.1540 | 0.1812 | 0.1854 |
| | 10 | 19445 | | | | | 0.0004 | 0.0025 | 0.0095 | 0.0193 | 0.0263 | 0.0571 | 0.1008 | 0.1392 | 0.1484 |
| | 11 | 12374 | | | | | 0.0001 | 0.0005 | 0.0026 | 0.0061 | 0.0090 | 0.0242 | 0.0525 | 0.0851 | 0.0944 |
| | 12 | 6187 | | | | | | 0.0001 | 0.0006 | 0.0015 | 0.0024 | 0.0081 | 0.0215 | 0.0409 | 0.0472 |
| | 13 | 2380 | | | | | | | 0.0001 | 0.0003 | 0.0005 | 0.0021 | 0.0068 | 0.0151 | 0.0182 |
| | 14 | 680 | | | | | | | | 0.0000 | 0.0001 | 0.0004 | 0.0016 | 0.0041 | 0.0052 |
| | 15 | 136 | | | | | | | | | | 0.0001 | 0.0003 | 0.0008 | 0.0010 |
| | 16 | 17 | | | | | | | | | | | | 0.0001 | 0.0001 |
| | 17 | 1 | | | | | | | | | | | | | |
| 18 | 0 | 1 | 0.8345 | 0.3972 | 0.1501 | 0.0536 | 0.0180 | 0.0056 | 0.0016 | 0.0007 | 0.0004 | 0.0001 | | | |
| | 1 | 18 | 0.1517 | 0.3763 | 0.3002 | 0.1704 | 0.0811 | 0.0338 | 0.0126 | 0.0061 | 0.0042 | 0.0012 | 0.0003 | 0.0001 | 0.0001 |
| | 2 | 153 | 0.0130 | 0.1683 | 0.2835 | 0.2556 | 0.1723 | 0.0958 | 0.0458 | 0.0259 | 0.0190 | 0.0069 | 0.0022 | 0.0008 | 0.0006 |
| | 3 | 816 | 0.0007 | 0.0473 | 0.1680 | 0.2406 | 0.2297 | 0.1704 | 0.1046 | 0.0690 | 0.0547 | 0.0246 | 0.0095 | 0.0039 | 0.0031 |
| | 4 | 3060 | | 0.0093 | 0.0700 | 0.1592 | 0.2153 | 0.2130 | 0.1681 | 0.1294 | 0.1104 | 0.0614 | 0.0291 | 0.0142 | 0.0117 |
| | 5 | 8567 | | 0.0014 | 0.0218 | 0.0787 | 0.1507 | 0.1988 | 0.2017 | 0.1812 | 0.1664 | 0.1146 | 0.0666 | 0.0382 | 0.0327 |
| | 6 | 18562 | | 0.0002 | 0.0052 | 0.0301 | 0.0816 | 0.1435 | 0.1873 | 0.1963 | 0.1941 | 0.1655 | 0.1181 | 0.0796 | 0.0708 |
| | 7 | 31819 | | | 0.0010 | 0.0091 | 0.0350 | 0.0820 | 0.1376 | 0.1682 | 0.1791 | 0.1891 | 0.1656 | 0.1310 | 0.1214 |
| | 8 | 43750 | | | 0.0002 | 0.0022 | 0.0120 | 0.0376 | 0.0811 | 0.1156 | 0.1326 | 0.1734 | 0.1863 | 0.1731 | 0.1669 |
| | 9 | 48610 | | | | 0.0004 | 0.0033 | 0.0139 | 0.0386 | 0.0642 | 0.0794 | 0.1284 | 0.1694 | 0.1848 | 0.1854 |
| | 10 | 43749 | | | | 0.0001 | 0.0008 | 0.0042 | 0.0149 | 0.0289 | 0.0385 | 0.0771 | 0.1247 | 0.1598 | 0.1669 |
| | 11 | 31817 | | | | | 0.0001 | 0.0010 | 0.0046 | 0.0105 | 0.0151 | 0.0374 | 0.0742 | 0.1116 | 0.1214 |
| | 12 | 18560 | | | | | | 0.0002 | 0.0012 | 0.0031 | 0.0047 | 0.0145 | 0.0354 | 0.0626 | 0.0708 |
| | 13 | 8566 | | | | | | | 0.0002 | 0.0007 | 0.0012 | 0.0045 | 0.0134 | 0.0277 | 0.0327 |
| | 14 | 3059 | | | | | | | | 0.0001 | 0.0002 | 0.0011 | 0.0039 | 0.0095 | 0.0117 |
| | 15 | 816 | | | | | | | | | | 0.0002 | 0.0009 | 0.0024 | 0.0031 |
| | 16 | 153 | | | | | | | | | | | 0.0001 | 0.0004 | 0.0006 |
| | 17 | 18 | | | | | | | | | | | | 0.0000 | 0.0001 |
| | 18 | 1 | | | | | | | | | | | | | |
| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 19 | 0 | 1 | 0.8262 | 0.3774 | 0.1351 | 0.0456 | 0.0144 | 0.0042 | 0.0011 | 0.0005 | 0.0003 | 0.0001 | | | |
| | 1 | 19 | 0.1586 | 0.3774 | 0.2852 | 0.1529 | 0.0685 | 0.0268 | 0.0093 | 0.0043 | 0.0029 | 0.0008 | 0.0002 | 0.0001 | |
| | 2 | 171 | 0.0144 | 0.1787 | 0.2852 | 0.2428 | 0.1540 | 0.0803 | 0.0358 | 0.0193 | 0.0138 | 0.0046 | 0.0013 | 0.0004 | 0.0003 |
| | 3 | 969 | 0.0008 | 0.0533 | 0.1796 | 0.2428 | 0.2182 | 0.1517 | 0.0869 | 0.0546 | 0.0422 | 0.0175 | 0.0062 | 0.0024 | 0.0018 |
| | 4 | 3876 | | 0.0112 | 0.0798 | 0.1714 | 0.2182 | 0.2023 | 0.1491 | 0.1093 | 0.0909 | 0.0467 | 0.0203 | 0.0092 | 0.0074 |
| | 5 | 11 628 | | 0.0018 | 0.0266 | 0.0907 | 0.1636 | 0.2023 | 0.1916 | 0.1639 | 0.1468 | 0.0933 | 0.0497 | 0.0265 | 0.0222 |
| | 6 | 27 130 | | 0.0002 | 0.0069 | 0.0374 | 0.0955 | 0.1574 | 0.1916 | 0.1912 | 0.1844 | 0.1451 | 0.0949 | 0.0593 | 0.0517 |
| | 7 | 50 383 | | | 0.0014 | 0.0122 | 0.0443 | 0.0974 | 0.1525 | 0.1776 | 0.1844 | 0.1797 | 0.1443 | 0.1058 | 0.0961 |
| | 8 | 75 574 | | | 0.0002 | 0.0032 | 0.0166 | 0.0487 | 0.0980 | 0.1332 | 0.1489 | 0.1797 | 0.1770 | 0.1525 | 0.1441 |
| | 9 | 92 368 | | | | 0.0007 | 0.0051 | 0.0198 | 0.0514 | 0.0814 | 0.0980 | 0.1464 | 0.1770 | 0.1791 | 0.1762 |
| | 10 | 92 368 | | | | 0.0001 | 0.0013 | 0.0066 | 0.0220 | 0.0407 | 0.0528 | 0.0976 | 0.1448 | 0.1720 | 0.1762 |
| | 11 | 75 574 | | | | | 0.0003 | 0.0018 | 0.0077 | 0.0166 | 0.0233 | 0.0532 | 0.0970 | 0.1352 | 0.1441 |
| | 12 | 50 382 | | | | | 0.0000 | 0.0004 | 0.0022 | 0.0055 | 0.0083 | 0.0237 | 0.0529 | 0.0866 | 0.0961 |
| | 13 | 27 129 | | | | | | 0.0001 | 0.0005 | 0.0015 | 0.0024 | 0.0085 | 0.0233 | 0.0448 | 0.0517 |
| | 14 | 11 627 | | | | | | | 0.0001 | 0.0003 | 0.0006 | 0.0024 | 0.0082 | 0.0185 | 0.0222 |
| | 15 | 3876 | | | | | | | | 0.0001 | 0.0001 | 0.0005 | 0.0022 | 0.0059 | 0.0074 |
| | 16 | 969 | | | | | | | | | | 0.0001 | 0.0005 | 0.0014 | 0.0018 |
| | 17 | 171 | | | | | | | | | | | 0.0001 | 0.0002 | 0.0003 |
| | 18 | 19 | | | | | | | | | | | | | |
| | 19 | 1 | | | | | | | | | | | | | |
| 20 | 0 | 1 | 0.8179 | 0.3585 | 0.1216 | 0.0388 | 0.0115 | 0.0032 | 0.0008 | 0.0003 | 0.0002 | | | | |
| | 1 | 20 | 0.1652 | 0.3774 | 0.2702 | 0.1368 | 0.0576 | 0.0211 | 0.0068 | 0.0030 | 0.0020 | 0.0005 | 0.0001 | | |
| | 2 | 190 | 0.0159 | 0.1887 | 0.2852 | 0.2293 | 0.1369 | 0.0669 | 0.0278 | 0.0143 | 0.0100 | 0.0031 | 0.0008 | 0.0002 | 0.0002 |
| | 3 | 1140 | 0.0010 | 0.0596 | 0.1901 | 0.2428 | 0.2054 | 0.1339 | 0.0716 | 0.0429 | 0.0323 | 0.0123 | 0.0040 | 0.0014 | 0.0011 |
| | 4 | 4845 | 0.0000 | 0.0133 | 0.0898 | 0.1821 | 0.2182 | 0.1897 | 0.1304 | 0.0911 | 0.0738 | 0.0350 | 0.0139 | 0.0059 | 0.0046 |
| | 5 | 15 504 | | 0.0022 | 0.0319 | 0.1028 | 0.1746 | 0.2023 | 0.1789 | 0.1457 | 0.1272 | 0.0746 | 0.0365 | 0.0180 | 0.0148 |
| | 6 | 38 759 | | 0.0003 | 0.0089 | 0.0454 | 0.1091 | 0.1686 | 0.1916 | 0.1821 | 0.1712 | 0.1244 | 0.0746 | 0.0432 | 0.0370 |
| | 7 | 77 518 | | | 0.0020 | 0.0160 | 0.0545 | 0.1124 | 0.1643 | 0.1821 | 0.1844 | 0.1659 | 0.1221 | 0.0830 | 0.0739 |
| | 8 | 125 960 | | | 0.0004 | 0.0046 | 0.0222 | 0.0609 | 0.1144 | 0.1480 | 0.1613 | 0.1797 | 0.1623 | 0.1296 | 0.1201 |
| | 9 | 167 940 | | | 0.0001 | 0.0011 | 0.0074 | 0.0271 | 0.0654 | 0.0986 | 0.1158 | 0.1597 | 0.1770 | 0.1660 | 0.1602 |
| | 10 | 184 734 | | | | 0.0002 | 0.0020 | 0.0099 | 0.0308 | 0.0543 | 0.0686 | 0.1171 | 0.1593 | 0.1755 | 0.1762 |
| | 11 | 167 940 | | | | | 0.0005 | 0.0030 | 0.0120 | 0.0247 | 0.0336 | 0.0710 | 0.1185 | 0.1533 | 0.1602 |
| | 12 | 125 954 | | | | | 0.0001 | 0.0008 | 0.0039 | 0.0092 | 0.0136 | 0.0355 | 0.0727 | 0.1104 | 0.1201 |
| | 13 | 77 510 | | | | | | 0.0002 | 0.0010 | 0.0028 | 0.0045 | 0.0146 | 0.0366 | 0.0653 | 0.0739 |
| | 14 | 38 755 | | | | | | | 0.0002 | 0.0007 | 0.0012 | 0.0049 | 0.0150 | 0.0314 | 0.0370 |
| | 15 | 15 502 | | | | | | | | 0.0001 | 0.0003 | 0.0013 | 0.0049 | 0.0121 | 0.0148 |
| | 16 | 4844 | | | | | | | | | 0.0000 | 0.0003 | 0.0013 | 0.0036 | 0.0046 |
| | 17 | 1140 | | | | | | | | | | 0.0000 | 0.0002 | 0.0008 | 0.0011 |
| | 18 | 190 | | | | | | | | | | | | 0.0001 | 0.0002 |
| | 19 | 20 | | | | | | | | | | | | | |
| | 20 | 1 | | | | | | | | | | | | | |
| n | k | $\binom{n}{k}$ | 0.01 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 1/3 | 0.35 | 0.40 | 0.45 | 0.49 | 0.50 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 2 | 0 | 1 | 0.2025 | 0.1600 | 0.1225 | 0.2222 | 0.0900 | 0.0625 | 0.0400 | 0.0225 | 0.0100 | 0.0025 | 0.0001 |
| | 1 | 2 | 0.4950 | 0.4800 | 0.4550 | 0.4445 | 0.4200 | 0.3750 | 0.3200 | 0.2550 | 0.1800 | 0.0950 | 0.0198 |
| | 2 | 1 | 0.3025 | 0.3600 | 0.4225 | 0.2222 | 0.4900 | 0.5625 | 0.6400 | 0.7225 | 0.8100 | 0.9025 | 0.9801 |
| 3 | 0 | 1 | 0.0911 | 0.0640 | 0.0429 | 0.0741 | 0.0270 | 0.0156 | 0.0080 | 0.0034 | 0.0010 | 0.0001 | |
| | 1 | 3 | 0.3341 | 0.2880 | 0.2389 | 0.2222 | 0.1890 | 0.1406 | 0.0960 | 0.0574 | 0.0270 | 0.0071 | 0.0003 |
| | 2 | 3 | 0.4084 | 0.4320 | 0.4436 | 0.2222 | 0.4410 | 0.4219 | 0.3840 | 0.3251 | 0.2430 | 0.1354 | 0.0294 |
| | 3 | 1 | 0.1664 | 0.2160 | 0.2746 | 0.0741 | 0.3430 | 0.4219 | 0.5120 | 0.6141 | 0.7290 | 0.8574 | 0.9703 |
| 4 | 0 | 1 | 0.0410 | 0.0256 | 0.0150 | 0.0247 | 0.0081 | 0.0039 | 0.0016 | 0.0005 | 0.0001 | | |
| | 1 | 4 | 0.2005 | 0.1536 | 0.1115 | 0.0988 | 0.0756 | 0.0469 | 0.0256 | 0.0115 | 0.0036 | 0.0005 | |
| | 2 | 6 | 0.3675 | 0.3456 | 0.3105 | 0.1482 | 0.2646 | 0.2109 | 0.1536 | 0.0975 | 0.0486 | 0.0135 | 0.0006 |
| | 3 | 4 | 0.2995 | 0.3456 | 0.3845 | 0.0988 | 0.4116 | 0.4219 | 0.4096 | 0.3685 | 0.2916 | 0.1715 | 0.0388 |
| | 4 | 1 | 0.0915 | 0.1296 | 0.1785 | 0.0247 | 0.2401 | 0.3164 | 0.4096 | 0.5220 | 0.6561 | 0.8145 | 0.9606 |
| 5 | 0 | 1 | 0.0185 | 0.0102 | 0.0053 | 0.0082 | 0.0024 | 0.0010 | 0.0003 | 0.0001 | | | |
| | 1 | 5 | 0.1128 | 0.0768 | 0.0488 | 0.0412 | 0.0284 | 0.0146 | 0.0064 | 0.0022 | 0.0005 | | |
| | 2 | 10 | 0.2757 | 0.2304 | 0.1811 | 0.0823 | 0.1323 | 0.0879 | 0.0512 | 0.0244 | 0.0081 | 0.0011 | |
| | 3 | 10 | 0.3369 | 0.3456 | 0.3364 | 0.0823 | 0.3087 | 0.2637 | 0.2048 | 0.1382 | 0.0729 | 0.0214 | 0.0010 |
| | 4 | 5 | 0.2059 | 0.2592 | 0.3124 | 0.0411 | 0.3602 | 0.3955 | 0.4096 | 0.3915 | 0.3280 | 0.2036 | 0.0480 |
| | 5 | 1 | 0.0503 | 0.0778 | 0.1160 | 0.0082 | 0.1681 | 0.2373 | 0.3277 | 0.4437 | 0.5905 | 0.7738 | 0.9510 |
| 6 | 0 | 1 | 0.0083 | 0.0041 | 0.0018 | 0.0027 | 0.0007 | 0.0002 | 0.0001 | | | | |
| | 1 | 6 | 0.0609 | 0.0369 | 0.0205 | 0.0165 | 0.0102 | 0.0044 | 0.0015 | 0.0004 | 0.0001 | | |
| | 2 | 15 | 0.1861 | 0.1382 | 0.0951 | 0.0412 | 0.0595 | 0.0330 | 0.0154 | 0.0055 | 0.0012 | 0.0001 | |
| | 3 | 20 | 0.3032 | 0.2765 | 0.2355 | 0.0549 | 0.1852 | 0.1318 | 0.0819 | 0.0415 | 0.0146 | 0.0021 | |
| | 4 | 15 | 0.2780 | 0.3110 | 0.3280 | 0.0412 | 0.3241 | 0.2966 | 0.2458 | 0.1762 | 0.0984 | 0.0305 | 0.0014 |
| | 5 | 6 | 0.1359 | 0.1866 | 0.2437 | 0.0165 | 0.3025 | 0.3560 | 0.3932 | 0.3993 | 0.3543 | 0.2321 | 0.0571 |
| | 6 | 1 | 0.0277 | 0.0467 | 0.0754 | 0.0027 | 0.1176 | 0.1780 | 0.2621 | 0.3771 | 0.5314 | 0.7351 | 0.9415 |
| 7 | 0 | 1 | 0.0037 | 0.0016 | 0.0006 | 0.0009 | 0.0002 | 0.0001 | | | | | |
| | 1 | 7 | 0.0320 | 0.0172 | 0.0084 | 0.0064 | 0.0036 | 0.0013 | 0.0004 | 0.0001 | | | |
| | 2 | 21 | 0.1172 | 0.0774 | 0.0466 | 0.0192 | 0.0250 | 0.0115 | 0.0043 | 0.0012 | 0.0002 | | |
| | 3 | 35 | 0.2388 | 0.1935 | 0.1442 | 0.0320 | 0.0972 | 0.0577 | 0.0287 | 0.0109 | 0.0026 | 0.0002 | |
| | 4 | 35 | 0.2918 | 0.2903 | 0.2679 | 0.0320 | 0.2269 | 0.1730 | 0.1147 | 0.0617 | 0.0230 | 0.0036 | |
| | 5 | 21 | 0.2140 | 0.2613 | 0.2985 | 0.0192 | 0.3177 | 0.3115 | 0.2753 | 0.2097 | 0.1240 | 0.0406 | 0.0020 |
| | 6 | 7 | 0.0872 | 0.1306 | 0.1848 | 0.0064 | 0.2471 | 0.3115 | 0.3670 | 0.3960 | 0.3720 | 0.2573 | 0.0659 |
| | 7 | 1 | 0.0152 | 0.0280 | 0.0490 | 0.0009 | 0.0824 | 0.1335 | 0.2097 | 0.3206 | 0.4783 | 0.6983 | 0.9321 |
| 8 | 0 | 1 | 0.0017 | 0.0007 | 0.0002 | 0.0003 | 0.0001 | | | | | | |
| | 1 | 8 | 0.0164 | 0.0079 | 0.0033 | 0.0024 | 0.0012 | 0.0004 | 0.0001 | | | | |
| | 2 | 28 | 0.0703 | 0.0413 | 0.0217 | 0.0085 | 0.0100 | 0.0038 | 0.0011 | 0.0002 | | | |
| | 3 | 56 | 0.1719 | 0.1239 | 0.0808 | 0.0171 | 0.0467 | 0.0231 | 0.0092 | 0.0026 | 0.0004 | | |
| | 4 | 70 | 0.2627 | 0.2322 | 0.1875 | 0.0213 | 0.1361 | 0.0865 | 0.0459 | 0.0185 | 0.0046 | 0.0004 | |
| | 5 | 56 | 0.2568 | 0.2787 | 0.2786 | 0.0171 | 0.2541 | 0.2076 | 0.1468 | 0.0839 | 0.0331 | 0.0054 | 0.0001 |
| | 6 | 28 | 0.1569 | 0.2090 | 0.2587 | 0.0085 | 0.2965 | 0.3115 | 0.2936 | 0.2376 | 0.1488 | 0.0515 | 0.0026 |
| | 7 | 8 | 0.0548 | 0.0896 | 0.1373 | 0.0024 | 0.1977 | 0.2670 | 0.3355 | 0.3847 | 0.3826 | 0.2793 | 0.0746 |
| | 8 | 1 | 0.0084 | 0.0168 | 0.0319 | 0.0003 | 0.0576 | 0.1001 | 0.1678 | 0.2725 | 0.4305 | 0.6634 | 0.9227 |
| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 9 | 0 | 1 | 0.0008 | 0.0003 | 0.0001 | 0.0001 | | | | | | | |
| | 1 | 9 | 0.0083 | 0.0035 | 0.0013 | 0.0009 | 0.0004 | 0.0001 | | | | | |
| | 2 | 36 | 0.0407 | 0.0212 | 0.0098 | 0.0037 | 0.0039 | 0.0012 | 0.0003 | 0.0000 | | | |
| | 3 | 84 | 0.1160 | 0.0743 | 0.0424 | 0.0085 | 0.0210 | 0.0087 | 0.0028 | 0.0006 | 0.0001 | | |
| | 4 | 126 | 0.2128 | 0.1672 | 0.1181 | 0.0128 | 0.0735 | 0.0389 | 0.0165 | 0.0050 | 0.0008 | | |
| | 5 | 126 | 0.2600 | 0.2508 | 0.2194 | 0.0128 | 0.1715 | 0.1168 | 0.0661 | 0.0283 | 0.0074 | 0.0006 | |
| | 6 | 84 | 0.2119 | 0.2508 | 0.2716 | 0.0085 | 0.2668 | 0.2336 | 0.1762 | 0.1069 | 0.0446 | 0.0077 | 0.0001 |
| | 7 | 36 | 0.1110 | 0.1612 | 0.2162 | 0.0037 | 0.2668 | 0.3003 | 0.3020 | 0.2597 | 0.1722 | 0.0629 | 0.0034 |
| | 8 | 9 | 0.0339 | 0.0605 | 0.1004 | 0.0009 | 0.1556 | 0.2253 | 0.3020 | 0.3679 | 0.3874 | 0.2985 | 0.0830 |
| | 9 | 1 | 0.0046 | 0.0101 | 0.0207 | 0.0001 | 0.0404 | 0.0751 | 0.1342 | 0.2316 | 0.3874 | 0.6302 | 0.9135 |
| 10 | 0 | 1 | 0.0003 | 0.0001 | | | | | | | | | |
| | 1 | 10 | 0.0042 | 0.0016 | 0.0005 | 0.0003 | 0.0001 | | | | | | |
| | 2 | 45 | 0.0229 | 0.0106 | 0.0043 | 0.0015 | 0.0014 | 0.0004 | 0.0001 | | | | |
| | 3 | 120 | 0.0746 | 0.0425 | 0.0212 | 0.0041 | 0.0090 | 0.0031 | 0.0008 | 0.0001 | | | |
| | 4 | 210 | 0.1596 | 0.1115 | 0.0689 | 0.0071 | 0.0368 | 0.0162 | 0.0055 | 0.0012 | 0.0001 | | |
| | 5 | 252 | 0.2340 | 0.2007 | 0.1536 | 0.0085 | 0.1029 | 0.0584 | 0.0264 | 0.0085 | 0.0015 | 0.0001 | |
| | 6 | 210 | 0.2384 | 0.2508 | 0.2377 | 0.0071 | 0.2001 | 0.1460 | 0.0881 | 0.0401 | 0.0112 | 0.0010 | |
| | 7 | 120 | 0.1665 | 0.2150 | 0.2522 | 0.0041 | 0.2668 | 0.2503 | 0.2013 | 0.1298 | 0.0574 | 0.0105 | 0.0001 |
| | 8 | 45 | 0.0763 | 0.1209 | 0.1757 | 0.0015 | 0.2335 | 0.2816 | 0.3020 | 0.2759 | 0.1937 | 0.0746 | 0.0042 |
| | 9 | 10 | 0.0207 | 0.0403 | 0.0725 | 0.0003 | 0.1211 | 0.1877 | 0.2684 | 0.3474 | 0.3874 | 0.3151 | 0.0914 |
| | 10 | 1 | 0.0025 | 0.0060 | 0.0135 | | 0.0282 | 0.0563 | 0.1074 | 0.1969 | 0.3487 | 0.5987 | 0.9044 |
| 11 | 0 | 1 | 0.0002 | 0.0000 | | | | | | | | | |
| | 1 | 11 | 0.0021 | 0.0007 | 0.0002 | 0.0001 | 0.0000 | | | | | | |
| | 2 | 55 | 0.0126 | 0.0052 | 0.0018 | 0.0006 | 0.0005 | 0.0001 | | | | | |
| | 3 | 165 | 0.0462 | 0.0234 | 0.0102 | 0.0019 | 0.0037 | 0.0011 | 0.0002 | | | | |
| | 4 | 330 | 0.1128 | 0.0701 | 0.0379 | 0.0037 | 0.0173 | 0.0064 | 0.0017 | 0.0003 | | | |
| | 5 | 462 | 0.1931 | 0.1471 | 0.0985 | 0.0052 | 0.0566 | 0.0268 | 0.0097 | 0.0023 | 0.0003 | | |
| | 6 | 462 | 0.2360 | 0.2207 | 0.1830 | 0.0052 | 0.1321 | 0.0803 | 0.0388 | 0.0132 | 0.0025 | 0.0001 | |
| | 7 | 330 | 0.2060 | 0.2365 | 0.2428 | 0.0037 | 0.2201 | 0.1721 | 0.1107 | 0.0536 | 0.0158 | 0.0014 | |
| | 8 | 165 | 0.1259 | 0.1774 | 0.2254 | 0.0019 | 0.2568 | 0.2581 | 0.2215 | 0.1517 | 0.0710 | 0.0137 | 0.0002 |
| | 9 | 55 | 0.0513 | 0.0887 | 0.1395 | 0.0006 | 0.1998 | 0.2581 | 0.2953 | 0.2866 | 0.2131 | 0.0867 | 0.0050 |
| | 10 | 11 | 0.0125 | 0.0266 | 0.0518 | 0.0001 | 0.0932 | 0.1549 | 0.2362 | 0.3248 | 0.3835 | 0.3293 | 0.0995 |
| | 11 | 1 | 0.0014 | 0.0036 | 0.0088 | | 0.0198 | 0.0422 | 0.0859 | 0.1673 | 0.3138 | 0.5688 | 0.8953 |
| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 12 | 0 | 1 | 0.0001 | | | | | | | | | | |
| | 1 | 12 | 0.0010 | 0.0003 | 0.0001 | 0.0000 | | | | | | | |
| | 2 | 66 | 0.0068 | 0.0025 | 0.0008 | 0.0002 | 0.0002 | | | | | | |
| | 3 | 220 | 0.0277 | 0.0125 | 0.0048 | 0.0008 | 0.0015 | 0.0004 | 0.0001 | | | | |
| | 4 | 495 | 0.0762 | 0.0420 | 0.0199 | 0.0019 | 0.0078 | 0.0024 | 0.0005 | 0.0001 | | | |
| | 5 | 792 | 0.1489 | 0.1009 | 0.0591 | 0.0030 | 0.0291 | 0.0115 | 0.0033 | 0.0006 | 0.0000 | | |
| | 6 | 924 | 0.2124 | 0.1766 | 0.1281 | 0.0035 | 0.0792 | 0.0401 | 0.0155 | 0.0040 | 0.0005 | | |
| | 7 | 792 | 0.2225 | 0.2270 | 0.2039 | 0.0030 | 0.1585 | 0.1032 | 0.0532 | 0.0193 | 0.0038 | 0.0002 | |
| | 8 | 495 | 0.1700 | 0.2128 | 0.2367 | 0.0019 | 0.2311 | 0.1936 | 0.1329 | 0.0683 | 0.0213 | 0.0021 | |
| | 9 | 220 | 0.0923 | 0.1419 | 0.1954 | 0.0008 | 0.2397 | 0.2581 | 0.2362 | 0.1720 | 0.0852 | 0.0173 | 0.0002 |
| | 10 | 66 | 0.0339 | 0.0639 | 0.1088 | 0.0002 | 0.1678 | 0.2323 | 0.2835 | 0.2924 | 0.2301 | 0.0988 | 0.0060 |
| | 11 | 12 | 0.0075 | 0.0174 | 0.0368 | 0.0000 | 0.0712 | 0.1267 | 0.2062 | 0.3012 | 0.3766 | 0.3413 | 0.1074 |
| | 12 | 1 | 0.0008 | 0.0022 | 0.0057 | | 0.0138 | 0.0317 | 0.0687 | 0.1422 | 0.2824 | 0.5404 | 0.8864 |
| 13 | 0 | 1 | | | | | | | | | | | |
| | 1 | 13 | 0.0005 | 0.0001 | | | | | | | | | |
| | 2 | 78 | 0.0036 | 0.0012 | 0.0003 | 0.0001 | 0.0001 | | | | | | |
| | 3 | 286 | 0.0162 | 0.0065 | 0.0022 | 0.0004 | 0.0006 | 0.0001 | | | | | |
| | 4 | 715 | 0.0495 | 0.0243 | 0.0101 | 0.0009 | 0.0034 | 0.0009 | 0.0001 | | | | |
| | 5 | 1287 | 0.1089 | 0.0656 | 0.0336 | 0.0016 | 0.0142 | 0.0047 | 0.0011 | 0.0001 | | | |
| | 6 | 1716 | 0.1775 | 0.1312 | 0.0833 | 0.0022 | 0.0442 | 0.0186 | 0.0058 | 0.0011 | 0.0001 | | |
| | 7 | 1716 | 0.2169 | 0.1968 | 0.1546 | 0.0022 | 0.1030 | 0.0559 | 0.0230 | 0.0063 | 0.0008 | | |
| | 8 | 1287 | 0.1989 | 0.2214 | 0.2154 | 0.0016 | 0.1803 | 0.1258 | 0.0691 | 0.0266 | 0.0055 | 0.0003 | |
| | 9 | 715 | 0.1350 | 0.1845 | 0.2222 | 0.0009 | 0.2337 | 0.2097 | 0.1535 | 0.0838 | 0.0277 | 0.0028 | |
| | 10 | 286 | 0.0660 | 0.1107 | 0.1651 | 0.0004 | 0.2181 | 0.2517 | 0.2457 | 0.1900 | 0.0997 | 0.0214 | 0.0003 |
| | 11 | 78 | 0.0220 | 0.0453 | 0.0836 | 0.0001 | 0.1388 | 0.2059 | 0.2680 | 0.2937 | 0.2448 | 0.1109 | 0.0070 |
| | 12 | 13 | 0.0045 | 0.0113 | 0.0259 | | 0.0540 | 0.1029 | 0.1787 | 0.2774 | 0.3672 | 0.3512 | 0.1152 |
| | 13 | 1 | 0.0004 | 0.0013 | 0.0037 | | 0.0097 | 0.0238 | 0.0550 | 0.1209 | 0.2542 | 0.5133 | 0.8775 |
| 14 | 0 | 1 | | | | | | | | | | | |
| | 1 | 14 | 0.0002 | 0.0001 | | | | | | | | | |
| | 2 | 91 | 0.0019 | 0.0005 | 0.0001 | | | | | | | | |
| | 3 | 364 | 0.0093 | 0.0033 | 0.0010 | 0.0002 | 0.0002 | | | | | | |
| | 4 | 1001 | 0.0312 | 0.0136 | 0.0049 | 0.0004 | 0.0014 | 0.0003 | 0.0000 | | | | |
| | 5 | 2002 | 0.0762 | 0.0408 | 0.0183 | 0.0008 | 0.0066 | 0.0018 | 0.0003 | | | | |
| | 6 | 3003 | 0.1398 | 0.0918 | 0.0510 | 0.0013 | 0.0232 | 0.0082 | 0.0020 | 0.0003 | | | |
| | 7 | 3431 | 0.1952 | 0.1574 | 0.1082 | 0.0014 | 0.0618 | 0.0280 | 0.0092 | 0.0019 | 0.0002 | | |
| | 8 | 3003 | 0.2088 | 0.2066 | 0.1759 | 0.0013 | 0.1262 | 0.0734 | 0.0322 | 0.0093 | 0.0013 | | |
| | 9 | 2002 | 0.1701 | 0.2066 | 0.2178 | 0.0008 | 0.1963 | 0.1468 | 0.0860 | 0.0352 | 0.0078 | 0.0004 | |
| | 10 | 1001 | 0.1040 | 0.1549 | 0.2022 | 0.0004 | 0.2290 | 0.2202 | 0.1720 | 0.0998 | 0.0349 | 0.0037 | |
| | 11 | 364 | 0.0462 | 0.0845 | 0.1366 | 0.0002 | 0.1943 | 0.2402 | 0.2501 | 0.2056 | 0.1142 | 0.0259 | 0.0003 |
| | 12 | 91 | 0.0141 | 0.0317 | 0.0634 | | 0.1134 | 0.1802 | 0.2501 | 0.2912 | 0.2570 | 0.1229 | 0.0081 |
| | 13 | 14 | 0.0027 | 0.0073 | 0.0181 | | 0.0407 | 0.0832 | 0.1539 | 0.2539 | 0.3559 | 0.3593 | 0.1229 |
| | 14 | 1 | 0.0002 | 0.0008 | 0.0024 | | 0.0068 | 0.0178 | 0.0440 | 0.1028 | 0.2288 | 0.4877 | 0.8687 |
| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 15 | 0 | 1 | | | | | | | | | | | |
| | 1 | 15 | 0.0001 | | | | | | | | | | |
| | 2 | 105 | 0.0010 | 0.0003 | 0.0001 | | | | | | | | |
| | 3 | 455 | 0.0052 | 0.0016 | 0.0004 | 0.0001 | 0.0001 | | | | | | |
| | 4 | 1365 | 0.0191 | 0.0074 | 0.0024 | 0.0002 | 0.0006 | 0.0001 | | | | | |
| | 5 | 3003 | 0.0515 | 0.0245 | 0.0096 | 0.0004 | 0.0030 | 0.0007 | 0.0001 | | | | |
| | 6 | 5005 | 0.1048 | 0.0612 | 0.0298 | 0.0007 | 0.0116 | 0.0034 | 0.0007 | 0.0001 | | | |
| | 7 | 6435 | 0.1647 | 0.1181 | 0.0710 | 0.0009 | 0.0348 | 0.0131 | 0.0035 | 0.0005 | | | |
| | 8 | 6435 | 0.2013 | 0.1771 | 0.1319 | 0.0009 | 0.0811 | 0.0393 | 0.0138 | 0.0030 | 0.0003 | | |
| | 9 | 5005 | 0.1914 | 0.2066 | 0.1906 | 0.0007 | 0.1472 | 0.0917 | 0.0430 | 0.0132 | 0.0019 | 0.0000 | |
| | 10 | 3003 | 0.1404 | 0.1859 | 0.2123 | 0.0004 | 0.2061 | 0.1651 | 0.1032 | 0.0449 | 0.0105 | 0.0006 | |
| | 11 | 1365 | 0.0780 | 0.1268 | 0.1792 | 0.0002 | 0.2186 | 0.2252 | 0.1876 | 0.1156 | 0.0428 | 0.0049 | |
| | 12 | 455 | 0.0318 | 0.0634 | 0.1110 | 0.0001 | 0.1700 | 0.2252 | 0.2501 | 0.2184 | 0.1285 | 0.0307 | 0.0004 |
| | 13 | 105 | 0.0090 | 0.0219 | 0.0476 | | 0.0916 | 0.1559 | 0.2309 | 0.2856 | 0.2669 | 0.1348 | 0.0092 |
| | 14 | 15 | 0.0016 | 0.0047 | 0.0126 | | 0.0305 | 0.0668 | 0.1319 | 0.2312 | 0.3432 | 0.3658 | 0.1303 |
| | 15 | 1 | 0.0001 | 0.0005 | 0.0016 | | 0.0047 | 0.0134 | 0.0352 | 0.0874 | 0.2059 | 0.4633 | 0.8601 |
| 16 | 0 | 1 | | | | | | | | | | | |
| | 1 | 16 | 0.0001 | | | | | | | | | | |
| | 2 | 120 | 0.0005 | 0.0001 | | | | | | | | | |
| | 3 | 560 | 0.0029 | 0.0008 | 0.0002 | | | | | | | | |
| | 4 | 1820 | 0.0115 | 0.0040 | 0.0011 | 0.0001 | 0.0002 | | | | | | |
| | 5 | 4368 | 0.0337 | 0.0142 | 0.0049 | 0.0002 | 0.0013 | 0.0002 | | | | | |
| | 6 | 8008 | 0.0755 | 0.0392 | 0.0167 | 0.0004 | 0.0056 | 0.0014 | 0.0002 | | | | |
| | 7 | 11439 | 0.1318 | 0.0839 | 0.0442 | 0.0005 | 0.0185 | 0.0058 | 0.0012 | 0.0001 | | | |
| | 8 | 12868 | 0.1812 | 0.1416 | 0.0923 | 0.0006 | 0.0487 | 0.0197 | 0.0055 | 0.0009 | 0.0001 | | |
| | 9 | 11438 | 0.1968 | 0.1889 | 0.1524 | 0.0005 | 0.1009 | 0.0524 | 0.0197 | 0.0045 | 0.0004 | | |
| | 10 | 8007 | 0.1684 | 0.1983 | 0.1982 | 0.0004 | 0.1649 | 0.1101 | 0.0550 | 0.0180 | 0.0028 | 0.0001 | |
| | 11 | 4367 | 0.1123 | 0.1622 | 0.2007 | 0.0002 | 0.2098 | 0.1801 | 0.1200 | 0.0555 | 0.0137 | 0.0008 | |
| | 12 | 1820 | 0.0572 | 0.1014 | 0.1553 | 0.0001 | 0.2040 | 0.2252 | 0.2001 | 0.1311 | 0.0514 | 0.0061 | |
| | 13 | 560 | 0.0215 | 0.0468 | 0.0888 | | 0.1465 | 0.2079 | 0.2463 | 0.2285 | 0.1423 | 0.0359 | 0.0005 |
| | 14 | 120 | 0.0056 | 0.0150 | 0.0353 | | 0.0732 | 0.1336 | 0.2111 | 0.2775 | 0.2745 | 0.1463 | 0.0104 |
| | 15 | 16 | 0.0009 | 0.0030 | 0.0087 | | 0.0228 | 0.0535 | 0.1126 | 0.2097 | 0.3294 | 0.3706 | 0.1376 |
| | 16 | 1 | 0.0001 | 0.0003 | 0.0010 | | 0.0033 | 0.0100 | 0.0281 | 0.0743 | 0.1853 | 0.4401 | 0.8515 |
| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 17 | 0 | 1 | | | | | | | | | | | |
| | 1 | 17 | | | | | | | | | | | |
| | 2 | 136 | 0.0003 | 0.0001 | | | | | | | | | |
| | 3 | 680 | 0.0016 | 0.0004 | 0.0001 | | | | | | | | |
| | 4 | 2380 | 0.0068 | 0.0021 | 0.0005 | | 0.0001 | | | | | | |
| | 5 | 6188 | 0.0215 | 0.0081 | 0.0024 | 0.0001 | 0.0006 | 0.0001 | | | | | |
| | 6 | 12376 | 0.0525 | 0.0242 | 0.0090 | 0.0002 | 0.0026 | 0.0005 | 0.0001 | | | | |
| | 7 | 19447 | 0.1008 | 0.0571 | 0.0263 | 0.0003 | 0.0095 | 0.0025 | 0.0004 | | | | |
| | 8 | 24307 | 0.1540 | 0.1070 | 0.0610 | 0.0004 | 0.0276 | 0.0093 | 0.0021 | 0.0003 | | | |
| | 9 | 24306 | 0.1882 | 0.1605 | 0.1134 | 0.0004 | 0.0644 | 0.0278 | 0.0084 | 0.0014 | 0.0001 | | |
| | 10 | 19445 | 0.1840 | 0.1926 | 0.1684 | 0.0003 | 0.1201 | 0.0668 | 0.0267 | 0.0065 | 0.0007 | | |
| | 11 | 12374 | 0.1431 | 0.1839 | 0.1991 | 0.0002 | 0.1784 | 0.1276 | 0.0680 | 0.0236 | 0.0039 | 0.0001 | |
| | 12 | 6187 | 0.0875 | 0.1379 | 0.1848 | 0.0001 | 0.2081 | 0.1914 | 0.1361 | 0.0668 | 0.0175 | 0.0010 | |
| | 13 | 2380 | 0.0411 | 0.0796 | 0.1320 | | 0.1868 | 0.2209 | 0.2093 | 0.1457 | 0.0605 | 0.0076 | |
| | 14 | 680 | 0.0144 | 0.0341 | 0.0701 | | 0.1245 | 0.1893 | 0.2393 | 0.2359 | 0.1556 | 0.0415 | 0.0006 |
| | 15 | 136 | 0.0035 | 0.0102 | 0.0260 | | 0.0581 | 0.1136 | 0.1914 | 0.2673 | 0.2800 | 0.1575 | 0.0117 |
| | 16 | 17 | 0.0005 | 0.0019 | 0.0060 | | 0.0169 | 0.0426 | 0.0957 | 0.1893 | 0.3150 | 0.3741 | 0.1447 |
| | 17 | 1 | 0.0000 | 0.0002 | 0.0007 | | 0.0023 | 0.0075 | 0.0225 | 0.0631 | 0.1668 | 0.4181 | 0.8429 |
| 18 | 0 | 1 | | | | | | | | | | | |
| | 1 | 18 | | | | | | | | | | | |
| | 2 | 153 | 0.0001 | | | | | | | | | | |
| | 3 | 816 | 0.0009 | 0.0002 | | | | | | | | | |
| | 4 | 3060 | 0.0039 | 0.0011 | 0.0002 | | | | | | | | |
| | 5 | 8567 | 0.0134 | 0.0045 | 0.0012 | 0.0000 | 0.0002 | | | | | | |
| | 6 | 18562 | 0.0354 | 0.0145 | 0.0047 | 0.0001 | 0.0012 | 0.0002 | | | | | |
| | 7 | 31819 | 0.0742 | 0.0374 | 0.0151 | 0.0002 | 0.0046 | 0.0010 | 0.0001 | | | | |
| | 8 | 43750 | 0.1247 | 0.0771 | 0.0385 | 0.0002 | 0.0149 | 0.0042 | 0.0008 | 0.0001 | | | |
| | 9 | 48610 | 0.1694 | 0.1284 | 0.0794 | 0.0003 | 0.0386 | 0.0139 | 0.0033 | 0.0004 | | | |
| | 10 | 43749 | 0.1863 | 0.1734 | 0.1326 | 0.0002 | 0.0811 | 0.0376 | 0.0120 | 0.0022 | 0.0002 | | |
| | 11 | 31817 | 0.1656 | 0.1891 | 0.1791 | 0.0002 | 0.1376 | 0.0820 | 0.0350 | 0.0091 | 0.0010 | | |
| | 12 | 18560 | 0.1181 | 0.1655 | 0.1941 | 0.0001 | 0.1873 | 0.1435 | 0.0816 | 0.0301 | 0.0052 | 0.0002 | |
| | 13 | 8566 | 0.0666 | 0.1146 | 0.1663 | 0.0000 | 0.2017 | 0.1987 | 0.1507 | 0.0786 | 0.0218 | 0.0014 | |
| | 14 | 3059 | 0.0291 | 0.0614 | 0.1103 | | 0.1680 | 0.2129 | 0.2153 | 0.1592 | 0.0700 | 0.0093 | |
| | 15 | 816 | 0.0095 | 0.0246 | 0.0547 | | 0.1046 | 0.1704 | 0.2297 | 0.2406 | 0.1680 | 0.0473 | 0.0007 |
| | 16 | 153 | 0.0022 | 0.0069 | 0.0190 | | 0.0458 | 0.0958 | 0.1723 | 0.2556 | 0.2835 | 0.1683 | 0.0130 |
| | 17 | 18 | 0.0003 | 0.0012 | 0.0042 | | 0.0126 | 0.0338 | 0.0811 | 0.1704 | 0.3002 | 0.3763 | 0.1517 |
| | 18 | 1 | | 0.0001 | 0.0004 | | 0.0016 | 0.0056 | 0.0180 | 0.0536 | 0.1501 | 0.3972 | 0.8345 |
| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$

| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |
|-----|-----|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 19 | 0 | 1 | | | | | | | | | | | |
| | 1 | 19 | | | | | | | | | | | |
| | 2 | 171 | 0.0001 | | | | | | | | | | |
| | 3 | 969 | 0.0005 | 0.0001 | | | | | | | | | |
| | 4 | 3876 | 0.0022 | 0.0005 | 0.0001 | | | | | | | | |
| | 5 | 11 628 | 0.0082 | 0.0024 | 0.0006 | | 0.0001 | | | | | | |
| | 6 | 27 130 | 0.0233 | 0.0085 | 0.0024 | 0.0000 | 0.0005 | 0.0001 | | | | | |
| | 7 | 50 383 | 0.0529 | 0.0237 | 0.0083 | 0.0001 | 0.0022 | 0.0004 | 0.0000 | | | | |
| | 8 | 75 574 | 0.0970 | 0.0532 | 0.0233 | 0.0001 | 0.0077 | 0.0018 | 0.0003 | | | | |
| | 9 | 92 368 | 0.1448 | 0.0976 | 0.0528 | 0.0002 | 0.0220 | 0.0066 | 0.0013 | 0.0001 | | | |
| | 10 | 92 368 | 0.1770 | 0.1464 | 0.0980 | 0.0002 | 0.0514 | 0.0198 | 0.0051 | 0.0007 | | | |
| | 11 | 75 574 | 0.1770 | 0.1797 | 0.1489 | 0.0001 | 0.0980 | 0.0487 | 0.0166 | 0.0032 | 0.0002 | | |
| | 12 | 50 382 | 0.1442 | 0.1797 | 0.1844 | 0.0001 | 0.1525 | 0.0974 | 0.0443 | 0.0122 | 0.0014 | | |
| | 13 | 27 129 | 0.0949 | 0.1451 | 0.1844 | 0.0000 | 0.1916 | 0.1574 | 0.0955 | 0.0374 | 0.0069 | 0.0002 | |
| | 14 | 11 627 | 0.0497 | 0.0933 | 0.1468 | | 0.1916 | 0.2023 | 0.1636 | 0.0907 | 0.0266 | 0.0018 | |
| | 15 | 3876 | 0.0203 | 0.0467 | 0.0909 | | 0.1491 | 0.2023 | 0.2182 | 0.1714 | 0.0798 | 0.0112 | |
| | 16 | 969 | 0.0062 | 0.0175 | 0.0422 | | 0.0869 | 0.1517 | 0.2182 | 0.2428 | 0.1796 | 0.0533 | 0.0008 |
| | 17 | 171 | 0.0013 | 0.0046 | 0.0138 | | 0.0358 | 0.0803 | 0.1540 | 0.2428 | 0.2852 | 0.1787 | 0.0144 |
| | 18 | 19 | 0.0002 | 0.0008 | 0.0029 | | 0.0093 | 0.0268 | 0.0685 | 0.1529 | 0.2852 | 0.3774 | 0.1586 |
| | 19 | 1 | | 0.0001 | 0.0003 | | 0.0011 | 0.0042 | 0.0144 | 0.0456 | 0.1351 | 0.3774 | 0.8262 |
| 20 | 0 | 1 | | | | | | | | | | | |
| | 1 | 20 | | | | | | | | | | | |
| | 2 | 190 | | | | | | | | | | | |
| | 3 | 1140 | 0.0002 | 0.0000 | | | | | | | | | |
| | 4 | 4845 | 0.0013 | 0.0003 | 0.0000 | | | | | | | | |
| | 5 | 15 504 | 0.0049 | 0.0013 | 0.0003 | | | | | | | | |
| | 6 | 38 759 | 0.0150 | 0.0049 | 0.0012 | | 0.0002 | | | | | | |
| | 7 | 77 518 | 0.0366 | 0.0146 | 0.0045 | 0.0000 | 0.0010 | 0.0002 | | | | | |
| | 8 | 125 960 | 0.0727 | 0.0355 | 0.0136 | 0.0001 | 0.0039 | 0.0008 | 0.0001 | | | | |
| | 9 | 167 940 | 0.1185 | 0.0710 | 0.0336 | 0.0001 | 0.0120 | 0.0030 | 0.0005 | | | | |
| | 10 | 184 734 | 0.1593 | 0.1171 | 0.0686 | 0.0001 | 0.0308 | 0.0099 | 0.0020 | 0.0002 | | | |
| | 11 | 167 940 | 0.1770 | 0.1597 | 0.1158 | 0.0001 | 0.0654 | 0.0271 | 0.0074 | 0.0011 | 0.0001 | | |
| | 12 | 125 954 | 0.1623 | 0.1797 | 0.1613 | 0.0001 | 0.1144 | 0.0609 | 0.0222 | 0.0046 | 0.0004 | | |
| | 13 | 77 510 | 0.1221 | 0.1659 | 0.1844 | 0.0000 | 0.1642 | 0.1124 | 0.0545 | 0.0160 | 0.0020 | | |
| | 14 | 38 755 | 0.0746 | 0.1244 | 0.1712 | | 0.1916 | 0.1686 | 0.1091 | 0.0454 | 0.0089 | 0.0003 | |
| | 15 | 15 502 | 0.0365 | 0.0746 | 0.1272 | | 0.1788 | 0.2023 | 0.1745 | 0.1028 | 0.0319 | 0.0022 | |
| | 16 | 4844 | 0.0139 | 0.0350 | 0.0738 | | 0.1304 | 0.1896 | 0.2182 | 0.1821 | 0.0898 | 0.0133 | 0.0000 |
| | 17 | 1140 | 0.0040 | 0.0123 | 0.0323 | | 0.0716 | 0.1339 | 0.2054 | 0.2428 | 0.1901 | 0.0596 | 0.0010 |
| | 18 | 190 | 0.0008 | 0.0031 | 0.0100 | | 0.0278 | 0.0669 | 0.1369 | 0.2293 | 0.2852 | 0.1887 | 0.0159 |
| | 19 | 20 | 0.0001 | 0.0005 | 0.0020 | | 0.0068 | 0.0211 | 0.0576 | 0.1368 | 0.2702 | 0.3774 | 0.1652 |
| | 20 | 1 | | | 0.0002 | | 0.0008 | 0.0032 | 0.0115 | 0.0388 | 0.1216 | 0.3585 | 0.8179 |
| n | k | $\binom{n}{k}$ | 0.55 | 0.60 | 0.65 | 2/3 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 | 0.99 |

Binomial PDF Formula

$$p(X = k) = \binom{n}{k} p^k q^{n-k}$$

$$\binom{n}{k} = \prod_{j=1}^k \frac{n+1-j}{j}$$