1. Plotting and fitting of Binomial distribution and graphical representation of probabilities.

Binomial Distribution:

The binomial distribution is a discrete probability distribution. It describes the outcome of binary scenarios, e.g. toss of a coin.

Binomial Distribution Formula:

$$P(x;n,p) = {}^{n}c_x \, p^x (1-p)^{n-x}$$

Where:

$P(x; n, p)$ is the probability of x successes in n trials in an experiment which can result in exactly two outcomes (success or failure).
p is the probability of success on an individual trial.
n is the number of trials.
x is the total number of successes.

Mean($\mu = np$)

Variance($\sigma^2 = npq$)

Implementation in Excel:

=BINOM.DIST(number_s, trials, probability_s, cumulative)

Where:

number_s: number of successes.
trials: total number of trials.
probability_s: probability of success on each trial.

cumulative: TRUE returns the cumulative probability; FALSE returns the exact probability

**Skewness In Case Binomial Distribution Can Be Defined As Follows:**

If $p = 0.5$, the binomial distribution will be symmetrical, regardless of the value of n.
If $p \neq 0.5$, the distribution will be skewed.
If $p < 0.5$, the distribution will be positively skewed or right-skewed. This means the bulk of the probability falls in the smaller numbers and the distribution tails off to the right.
If $p > 0.5$, the distribution will be negatively skewed or left-skewed. This means the

n(Number Of Trials)	8
p(Probability of Success on given Trails)	0.8

k(Number of success)	Binomial Distribution
0	0.00000256
1	0.00008192
2	0.00114688
3	0.00917504
4	0.0458752
5	0.14680064
6	0.29360128
7	0.33554432
8	0.16777216

Binomial Distribution (n=8, p=0.8)
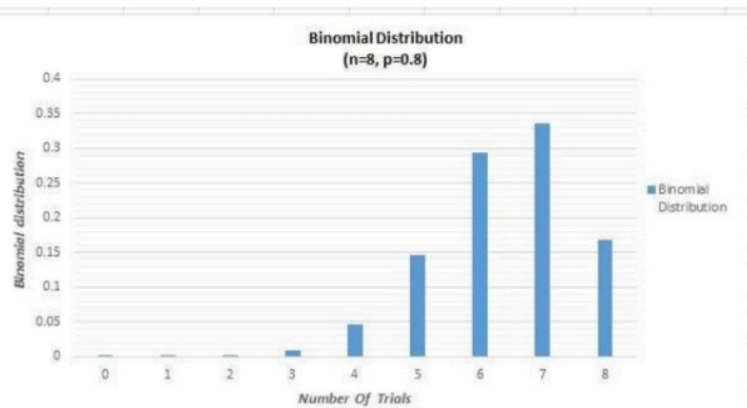
n(Number Of Trials)	8
p(Probability of Success on given Trails)	0.5

k(Number of success)	Binomial Distribution
0	0.00390625
1	0.03125
2	0.109375
3	0.21875
4	0.2734375
5	0.21875
6	0.109375
7	0.03125
8	0.00390625

Binomial Distribution (n=8, p=0.5)
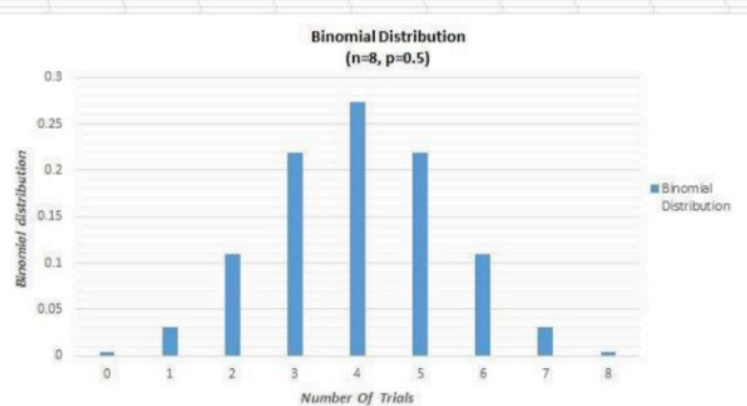
n(Number Of Trials)	8
p(Probability of Success on given Trails)	0.2

k(Number of success)	Binomial Distribution
0	0.16777216
1	0.33554432
2	0.29360128
3	0.14680064
4	0.0458752
5	0.00917504
6	0.00114688
7	0.00008192
8	0.00000256

Binomial Distribution (n=8, p=0.2)