Summaries:

1. Z-Test:
Z-test is a statistical test used to determine whether two samples have different proportions of success or failure. It compares the sample proportion to a standard normal distribution with a mean of 0 and a standard deviation of 1, which represents the error in the measurement. The formula for Z-test is:

P + (1 - P) * Z = (1 - P) * Z

Where P is the proportion of success in the sample, and Z is the standard error of the mean.

2. Standard Error of the Mean (SEM):
Standard Error of the Mean (SEM) is a measure of the variability of the sample mean. It represents the range within which the true population mean lies with a certain degree of confidence. The formula for SEM is:

SE = sqrt(P * (1 - P)) / N

Where N is the number of samples, and P is the proportion of success in the sample.

3. Proportion of Success:
The proportion of success refers to the percentage or ratio of successful outcomes in a given sample. It can be calculated using the following formula:

Proportion = (Number of successes / Total number of samples) x 100%

4. Lower and Upper Limits:
Lower and upper limits are used to determine the range within which the true population mean lies with a certain degree of confidence. The lower limit is the minimum value of the sample proportion that can be used to estimate the population mean, while the upper limit is the maximum value of the sample proportion that can be used to estimate the population mean.

5. Chi-Square Test:
Chi-square test is a statistical test used to determine whether two samples have different proportions of success or failure. It compares the observed frequencies in each sample to the expected frequencies under a null hypothesis of independence. The formula for chi-square test is:

Observations - Expected Frequencies = Chi-Square Statistic

Where observations are the number of successes in each sample, and expected frequencies are the proportion of success in each sample.

6. Proportion of Failure:
The proportion of failure refers to the percentage or ratio of unsuccessful outcomes in a given sample. It can be calculated using the following formula:

Proportion = (Number of failures / Total number of samples) x 100%

7. Sample Size:
Sample size refers to the number of observations or data points used to estimate a population

parameter. It is an important factor in statistical analysis as it affects the precision of the estimates and the level of confidence associated with them. The formula for sample size is:

N = (Number of observations / (Total number of samples * Sample proportion))

Where N is the sample size, and P is the proportion of success in the sample.