1. $Class width≈\frac{\left(Max. data value\right)-(Min. data value)}{No. of classes}$
2. $Relative Frequency for a class=\frac{Frequency of the class}{Sum of the all frequency}$
3. $Percentage for a class=\frac{Frequency of the class}{Sum of the all frequency}×$
4. $\overbar{x}= \frac{Σx}{n}$ Mean
5. $\overbar{x}= \frac{Σ(f.x)}{Σf}$ Mean (Frequency Table)
6. $Median=\left(\frac{n+1}{2}\right)^{th}item, when n is odd$

 $Median=\frac{\left(\frac{n}{2}\right)^{th}item+\left(\frac{n}{2}+1\right)^{th}item}{2}, when n is even$

1. $Range=\left(max. data value\right)-(min. data value)$
2. $Midrange=\frac{\left(max. data value\right)+(min. data value)}{2}$
3. $Mode=Most frequently occuring item$
4. $s=\sqrt{ \frac{Σ(x-\overbar{x})^{2}}{n-1}}$ sample Standard Deviation
5. S=$\sqrt{\frac{n\left(Σx^{2}\right)-(Σx)^{2}}{n(n-1)}}$ sample Standard Deviation (Shortcut)
6. $σ=\sqrt{ \frac{Σ(x-μ)^{2}}{N}}$ Population Standard Deviation
7. $z=\frac{X-\overbar{X}}{s}$ for sample
8. $z=\frac{X-μ}{σ} for Population$
9. $P\left(A\right)=\frac{No. of way A occured}{Total No. of different simple events}=\frac{s}{n}$
10. P(A or B) = P(A) + P(B) ; if A, B are mutually exclusive
11. P(A orB) = P(A) + P(B) – P(A and B)

 If A, B are not mutually exclusive

1. $P\left(A and B\right)=P\left(A\right)∙P\left(A\right), if A,B are independent$

 Multiplication Rule

1. $P\left(A and B\right)=P\left(A\right)∙P\left(B\right), if A,B are independent$
2. $P\left(A\right)=1-P\left(A^{c}\right), Rule of complement$
3. $P\left(A\right)=\frac{P(Aand B)}{P(A)}$ Conditional Probability
4. $nP\_{r}=\frac{n!}{\left(n-r\right)!} Permutation$
5. $nC\_{r}=\frac{n!}{\left(n-r\right)! r!} Combination$
6. Probability distribution Requirements
	1. There is numerical random variable x and its value are associated with corresponding probability.
	2. $ΣP\left(X\right)=1$, where X assumes all possible value.
	3. $0\leq X\leq 1$, for every individual value of the random variable X.
7. $μ=Σ\left[x∙P(x)\right]$ Mean of the probability distribution.
8. $σ^{2}=Σ\left[(x-μ)^{2}∙P(x)\right]$ Variance
9. $σ^{2}=Σ\left[x^{2}∙P(x)\right]-μ^{2}$ Variance
10. $σ=\sqrt{Σ\left[(x-μ)^{2}∙P(x)\right]}$ Standard Deviation
11. $σ=\sqrt{Σ\left[x^{2}∙P(x)\right]-μ^{2}}$ Standard Deviation
12. $P\left(x\right)=\frac{n!}{\left(n-x\right)!x!}∙p^{x}∙q^{n-x} for x=0,1,2,3,………..,n $(Binomial Probability)

 $where n= number of trials$

 $ x=number of successes among n trials$

 $ p= probability of success and q=probabilityof failure i.e. \left(q=1-p\right)$

 $mean μ=np$

 $Variance σ^{2}=npq , Standard deviation σ=\sqrt{npq}$

1. $P\left(x\right)=\frac{μ^{x}∙e^{-μ}}{x!}$ , where e=2.71828 Poisson Probability

 $μ=mean, σ=\sqrt{μ} (Standard Deviation)$

1. $P\left(x\right)=\frac{1}{σ\sqrt{2π}}e^{-\frac{1}{2}\left(\frac{x-μ}{σ}\right)^{2}} (Normal Ddistribution Probability)$
2. Estimation of Population Proportion p.

 $Margin of error, E=Z\_{^{α}/\_{2}}\sqrt{\frac{\hat{p}\hat{q}}{n}}$ Where $\hat{p}=sample proportion, \hat{q}=1-\hat{p}$

 $Z\_{^{α}/\_{2}}=z score seperating area of ^{α}/\_{2}in the right tail of standard normal distribution$

 $Confidence Interval \hat{p}-E<p<\hat{p}+E$

 $n=\frac{\left[Z\_{^{α}/\_{2}}\right]^{2}\hat{p}\hat{q}}{E^{2}} when an estimate \hat{p} is known$

 $n=\frac{\left[Z\_{^{α}/\_{2}}\right]^{2}0.25}{E^{2}} when no estimate \hat{p} is known$

1. Estimation of Population mean with $σ$ not known

 $Margin of error, E=t\_{^{α}/\_{2}}\frac{s}{\sqrt{n}} $ Where $s=sample standard deviation, $

 $t\_{^{α}/\_{2}}=critical t value seperating area of ^{α}/\_{2}in the right tail of t distribution$

 $Confidence Interval \overbar{x}-E<μ<\overbar{x}+E$ Where $μ=Population mean$

 $\overbar{x}=sample mean, σ=population standard deviation $

 $n=\left[\frac{Z\_{^{α}/\_{2}σ}}{E}\right]^{2} Required sample size$

1. Estimation of Population mean with $σ$ known

 $Margin of error, E=z\_{^{α}/\_{2}}\frac{σ}{\sqrt{n}}$ Where $σ=population standard deviation, $

 $z\_{^{α}/\_{2}}=critical z score seperating area of ^{α}/\_{2}in the right tail of z distribution$

 $Confidence Interval \overbar{x}-E<μ<\overbar{x}+E$ Where $μ=Population mean$

 $\overbar{x}=sample mean, σ=population standard deviation $

 $n=\left[\frac{Z\_{^{α}/\_{2}σ}}{E}\right]^{2} Required sample size$

1. Estimation of Population standard deviation $σ$ or variance $σ^{2}$

 $Confidence Interval for population variance \frac{\left(n-1\right)s^{2}}{χ\_{R}^{2}}<σ^{2}<\frac{\left(n-1\right)s^{2}}{χ\_{L}^{2}}$

$$Confidence Interval for population S. D. \sqrt{\frac{\left(n-1\right)s^{2}}{χ\_{R}^{2}}}<σ<\sqrt{\frac{\left(n-1\right)s^{2}}{χ\_{L}^{2}}}$$

 Where $s=sample standard deviation$

 $σ=population standard deviation, σ^{2}=population variance $

 $χ\_{R}^{2}=Right tailed critica value of χ, χ\_{L}^{2}=Left tailed critica value of χ$

1. Testing of a claim about a population proportion p.

$np\geq 5 and nq\geq 5; μ=np; σ=\sqrt{npq} ; \hat{p}=\frac{x}{n} ; q=1-p$

 $z=\frac{\hat{p}-p}{\sqrt{\frac{pq}{n}}}$

1. Testing of a claim about a population mean with $σ$ not known.

$\overbar{x}=sample mean; n=sample size; μ\_{\overbar{x}}=population mean ; n\geq 30 $

 $t=\frac{\overbar{x}-μ\_{\overbar{x}}}{\frac{s}{\sqrt{n}}} ;with df=n-1$

1. Testing of a claim about a population mean with $σ$ known.

$\overbar{x}=sample mean; n=sample size; μ\_{\overbar{x}}=population mean ; n\geq \_{}30 $

 $z=\frac{\overbar{x}-μ\_{\overbar{x}}}{\frac{σ}{\sqrt{n}}} $

1. Testing of a claim about $σ$ or$ σ^{2}$.

$s=sample S.D.; n=sample size; s^{2}=samlle variance ; σ=claimed population S.D. $

 $χ^{2}=\frac{(n-1)s^{2}}{σ^{2}} ;with df=n-1$