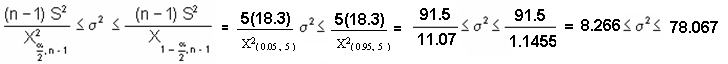
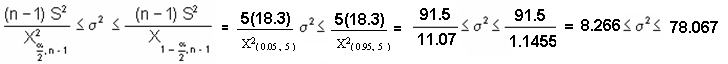
Given 22, 23, 19, 17, 29, 25 that is the 90% confidence interval for the variance (Variance calculated = 18.3 )



Given 12, 13, 9, 7, 19, 15 what is the 90% confidence interval for the variance? (Variance calculated = 18.3 )



The standard deviation interval will be (2.87 , 8.83)

**DF**

In statistics: is the number of independent and fair comparisons. John age – Peter age (fair comparison)

In DOE: equal to one less than the number of levels for that factor

Chi square with an unknown population variance (rows-1) (columns-1)

Subtract 2 from total number of samples for DF

* 2 Mean t test with equal ( or unknown but considered equal) variance n1 + n2 -2
* 2 Mean t test with unknown (considered unequal) requires ½ page of manual calculation and almost never is a whole number, it is a tricky calculation and is rounding to the next lower number

Subtract 1 from total number of samples for DF

* T distribution
* Chi square with a known population variance DF = n-1
* Paired t test

You have conducted a designed experiment at 3 levels yielding the following code data

|  |  |  |
| --- | --- | --- |
| A | B | C |
| 6 | 5 | 3 |
| 3 | 9 | 4 |
| 5 | 1 | 2 |
| 2 |  |  |

DF for the error sum of square is DF = 10-1 = 9 Treatments ( 3 -1 ) = 2 9-2 = 7

3 machines are being evaluated in a one way ANOVA, a total of 16 trials have been conducted.

DF = 16-1 = 15

Treatment DF = 3-1 = 2

Error DF = n – t = 15 – 2 = 13

A 2 way ANOVA has r levels for 1 variable and c levels for the second variable with 2 observations per cell. Degree of freedom **for interaction** is: ( r -1 ) (c -1 )

The degrees of freedom for a contingency table containing 3 rows and 4 columns is**:** **Df=(r-1)(c-1)=2 \* 3 = 6**

The results of a designed experiment are to be analyzed using a chi-square test. There are 5 treatments under consideration and each treatment falls under 2 categories (success or failure). How many degrees of freedom? (2 -1) ( 5-1) = 4

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| The data set below is from a completely randomized design (one factor experiment).   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Assay 1 | Assay 2 | Assay 3 | Assay 4 | Assay 5 | | 50 | 54 | 57 | 51 | 54 | | 52 | 55 | 56 | 49 | 54 | | 51 | 56 | 56 | 48 | 53 | | 54 | 52 | 56 | 49 | 52 | | 49 | 51 | 54 | 51 | 52 |   Degrees of freedom for the source of variation within treatments? 20 = k(n-1)  Degrees of freedom **for variance** = 20 |

The correction factor will be **correction factor (**T2/N **) =** (x) 2 / N = (1316)2 / 25 = 69,274

An experiment with 8 factors. 2 of the factors are temperature and pressure. The levels for temperature are 25, 50, 75. The levels for pressure are 14, 28, 42, 56. How many degrees of freedom to determine the effect of the interaction between temperature and pressure? (3-1)(4-1) = 6

4 inspectors were evaluated for detection or non detection of defects in 20 samples DF = (4-1) (2-1) = 3 (We evaluate inspectors, not samples)

detection or non detection = 2 columns

When comparing performance before and after training = Pair test

|  |  |
| --- | --- |
| Z or t | Compares Mean from one sample to Mean from population (or history) |
| Pair t test | Determine if Mean in shift A (sample or population1) is the same on Shift B (sample or population2) |
| F | Determine if variance in machine #1 (sample or population1) is the same on machine #2 (sample or population2)  Compares variance from one population (shift A) to variance from another population (Shift B) |
| Chi | Compares variance from one sample to variance from population (or history) |

Inference about a population using a single sample mean is determined using Z or t test.