

## CHI-Square Goodness of Fit Calculation Practice

Use this Calculator to find the Chi Statistic:

[Vassar Stats Calculator for One Way Goodness of Fit Test](http://faculty.vassar.edu/lowry/csfit.html)

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1. Statement of the null and research hypothesis
2. Setting the level of risk or level of significance associated with null hypothesis
3. Selection of the appropriate test statistic (any test between frequencies or proportions of mutually exclusive categories requires the chi-square).
4. Computation of the obtained or observed value

| Category | O observed | E expected | D difference | (O-E) <sup>2</sup> | (o-E) <sup>2</sup> /E |
|----------|------------|------------|--------------|--------------------|-----------------------|
| For      | 23         | 30         | 7            | 49                 | 1.63                  |
| Maybe    | 17         | 30         | 13           | 169                | 5.63                  |
| Against  | 50         | 30         | 20           | 400                | 13.33                 |
| Totals   | 90         | 90         |              |                    | 20.59<br>rded=20.6    |

Another way to do Expected Frequency is to divide the total observed frequency (90) by the number of categories (3) ..... $90/3=30$ .

5. For each cell subtract the expected frequency from the observed frequency and put in D.
6. Square the observed minus the expected value and put in column 4.
7. Divide the difference between the observed and the expected frequencies you have squared by the expected frequency and put in column 5.
8. Sum up this column to find the total chisquare value =20.6
9. Determine the value needed for rejection of the null hypothesis using the table of critical values. To do this, determine the degrees of freedom (df) which approximates the number of categories in which data have been organized. The degrees of freedom are  $R - 1$  where R equals rows, or  $3 - 1 = 2$
10. Use this number (2) and the level of risk you are willing to take, eg. .05, then look up the critical value which would be 5.99. So at the .05 level, with 2 degrees of freedom, the value needed to reject the null hypothesis is 5.99
11. Compare your obtained value and the critical value. The obtained is 20.6 and the critical value is 5.99. It does exceed the critical by quite a bit, so the difference is significant.