χ^2 Goodness of Fit Test

We perform a χ^2 - test: Goodness of Fit (GOF-test) in Excel.

At a municipal election the votes was distributed like this:

Party	Soc.	Rad.	Kons.	SF	DF	Venstre	Total
%	26.2	5.8	11.8	13.1	14.2	28.9	100

Shortly before the next election 920 persons responded on a opinion survey.
The question was: "Who would you vote on, if there was selection tomorrow?"
The answers was distributed like this:

Party	Soc.	Rad.	Kons.	SF	DF	Venstre	Total
Number	258	56	89	133	112	272	920

Assume the Null Hypothesis: The distribution is unchanged compared to the selection.

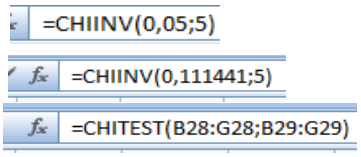
a. Calculate a table with an expected number of votes under the Null Hypothesis.
b. Calculate the critical value k, the test χ^2 , and the probability p .
c. Determine on the level of significance 5 % , whether the Null Hypothesis must be rejected.

a) To calculate the table with the expected values, we must for every party,
take the percentage from the election and multiply it with the 920 surveyed persons.
as an example: The expected numbers for Soc.: $0.262 \cdot 920 = 241.04$

Party	Soc.	Rad.	Kons.	SF	DF	Venstre	Total
obs. Num	258	56	89	133	112	272	920
exp. Num	241.04	53.36	108.56	120.52	130.64	265.88	920

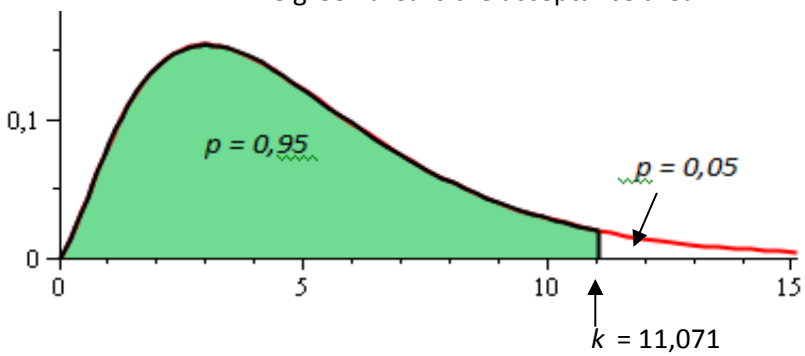
b)

level of significance	0,05
Numbers of rows:	2
Number of columns	6
degrees of freedom	5
k - value:	11.071
χ^2 - test:	8.940
p - value:	0.1114



c) We may accept the Null Hypotesis, because p = 11.1 % , is greater than the tests 0.05 significance level for the distribution. And $\chi^2 = 8.94$, is less than the significancelevel $k = 11.071$.
(Two ways to solve the test). ie. On the existing basis we can not reject the null hypothesis:
The distribution is unchanged compared to a selection, eg. tomorrow.

The green area is the acceptance area.



In this diagram:
Swap the decimal comma
to the english decimal dot.