

Chi Squared Test for Independence

A randomly selected group of 80 people were asked what their favourite genre of music was: pop, classical, folk or jazz. The results are in the table below.

	Pop	Classical	Folk	Jazz	Total
Male	18	9	3	8	38
Female	22	6	7	7	42
Total	40	15	10	15	80

A χ^2 test was carried out at the 10% significance level.

- Write down the null and alternative hypotheses.
- Show that the expected value for a female liking pop is 21.
- Find the full table of expected values.
- Combine two columns so that all expected values are greater than 5 and write down the new observed and expected tables.
- Write down the degrees of freedom for the new table.
- Use your GDC to find the χ^2 test statistic and the p -value for this test.
- Determine whether the null hypothesis is accepted or not.