χ^2 Chi squared

(test of indepence)

Here is some made up data in a contingency table.
It outlines the number of students at a university on certain courses and we will investigate to see if their is a gender bias in what people choose to study.

	Maths	English	Engineering	Economics
Female	48	61	47	38
Male	54	38	48	42

Always, **ALWAYS** state the null and alternative hypotheses.

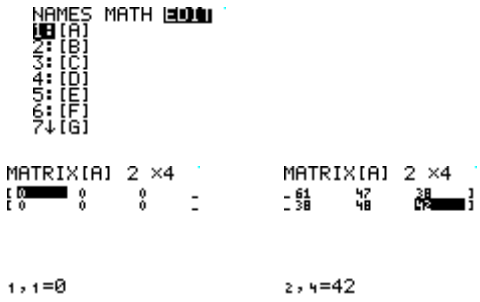
H_0: Subject chosen is independent of gender
H_1: Subject chosen is not independent of gender
We will test at the 5% level.

Now enter the data into a matrix on the calculator.

(This is to tell the calculator their are 2 rows and 4 columns. Then just enter the data.)

2nd MATRX ▶ ▶ ENTER

2 ENTER 4 ENTER



Time to perform the test.

STAT ▶ ▶ ALPHA PRGM

ENTER ENTER ENTER

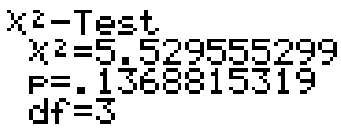
Interpret the results

p > 0.05 so we accept H_0
Subject is independent of gender.

The χ^2 value tells us how far we are from a perfectly independent set of data.
It must be compared to the critical value found in your tables. A big χ^2 would cause us to reject the null hypothesis.

The p value is the probability of getting a set of figures like this IF they are independent. You may think of it as the probability that H_0 is true. If p is greater than the confidence level then accept H_0

df is the degrees of freedom and is found by (#rows-1) x (#columns-1) ie 3x1 in this case



Bonus!
When performing the test the calculator will work out all the expected values and place them in matrix B

2nd MATRX ▼ ENTER ENTER