Practice Problem: Lab 10

Consider a problem in which we observe students to see if they took notes by hand or by laptop and recorded whether they passed or failed. Of the 67 that used a laptop 44 passed. Of the 76 that wrote by hand 56 of them passed. Construct an observed and expected table. Compute the chi-squared statistic and find the p-value from the chi-squared table. Interpret your results.

Observed

	Pass	Fail	Total
Laptop	44	23	67
Hand	56	20	76

Expected: (44+56)/(67+76)= 0.699

	Pass	Fail	Total
Laptop	46.83	20.17	67
Hand	53.12	22.88	76

$$\chi^2 = \frac{(44-46.83)^2}{46.83} + \frac{(23-20.17)^2}{20.17} + \frac{(56-53.12)^2}{53.12} + \frac{(20-22.88)^2}{22.88}$$

χ^2= 1.087

df=1

From the table, everything below 1.087 is p=0.701.

Therefore p-value: 1-0.701= 0.299

There is about a 30% probability of observing such an association by chance alone. There is no statistical evidence that writing notes on a laptop or by hand impacts test performance.