

# JMP® Introductory Lab Activities

## Activity 14: Hypothesis Testing Proportions

---



**Data Sets:** Big Class.jmp

### Summary

For this activity, the data represent a random sample of 40 students attending the prom in April. You will determine if the proportion of females at the event is different from 0.5. First, you will conduct a z-test using a calculator, and then you'll use a chi-square test in JMP. You'll compare results, and summarize in a report (required output and discussion is in italics).

### Conduct a z-Test Using a Calculator

Open the file **Big Class.jmp** from the **Sample Data** directory. You are interested in the column labeled **sex**.

Go to **Analyze > Distribution**, select sex as **Y, Columns** and click **OK**.

Look at the bar chart and the **Frequencies** table.

1. *What do the values 0.45000 and 0.55000 represent in the frequency table?*
2. *Does there appear to be evidence of a difference in the proportion of males and females attending the prom?*
3. *Use a calculator and the proportions from the JMP output to perform a large sample z-test to determine if the proportion of females is greater than 0.5.*

*Show all parts of the problem, including:*

- *The hypotheses.*
- *The conditions and requirements for the test.*
- *The formula for the test statistic.*
- *The test statistic and p-value, and your work.*
- *Your conclusions.*

### Conduct a Chi-Square Test Using JMP®

In the **Distribution** output, click on the **red triangle** next to **sex** and select **Test Probabilities**.

In the **Test Probabilities** table, enter **0.5** for both F and M under **Hypoth Prob**.

By default, JMP has selected the two-sided chi-square test. Click **Done**.

Level	Estim Prob	Hypoth Prob
F	0.45000	0.50000
M	0.55000	0.50000

Click then Enter Hypothesized Probabilities.

Select an alternative hypothesis for testing probabilities.

☒ probabilities not equal to hypothesized value (two-sided chi-square test)

☐ probability greater than hypothesized value (exact one-sided binomial test)

☐ probability less than hypothesized value (exact one-sided binomial test)

Done Help

JMP conducts two tests. We'll focus on the results for the **Pearson Chi-Square** test (the bottom row).

4. *How do the results from JMP compare to the results from your calculator?*
5. *Looking at the computer output, how is the chi-square value related to the z-score calculated earlier? Hint: Square the z-score (don't round your z-score entry).*
6. *What was the p-value for the one proportion z-test? How is the p-value in the z-test related to the chi-square probability?*