Members of the 12 PM section of Math 101 were asked the question: Have you ever cheated on a college exam? The following number of responses, sorted by gender, was observed.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>37</td>
<td>68</td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
<td>34</td>
</tr>
</tbody>
</table>

Now assume, for instructional purposes, that this group of students is a good sample (it’s not), and that it is representative of the population of all college students. Note: This population is effectively infinite.

1. Using the class as a whole, compute the proportion of students who have ever cheated on a college exam. Then prepare a confidence interval at level 0.99 for the parameter (= the actual proportion of college students who have ever cheated on a college exam).

2. Now suppose that you want to know if there is a statistically significant difference in the response rate for Females and Males.

   You will perform a $\chi^2$ test at $\alpha = 0.01$.

   (a) State the Null hypothesis and the Alternate hypothesis.

   (b) Form the expected distribution, round to one decimal place.

   (c) Compute the degrees of freedom, $d$, and the $\chi^2$ statistic.

   (d) Interpret your result. (Do you reject OR not reject your Null hypothesis?)

3. Does the actual proportion of Females who said Yes lie in the confidence interval that you prepared? How about the proportion of Males who said Yes?