Members of the 12 PM section of Math 101 were asked the question: Is downtown DeKalb safe at night? The following number of responses, sorted by age, was observed.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 or over</td>
<td>58</td>
<td>22</td>
</tr>
<tr>
<td>20 or younger</td>
<td>64</td>
<td>28</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 think that downtown DeKalb safe at night. Then prepare a confidence interval at level 0.99 for the parameter (= the actual proportion of college students who think that downtown DeKalb safe at night).

2. Now suppose that you want to know if there is a statistically significant difference in the response rate for the different age groups.
   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) Interprete your result. (Do you reject OR not reject your Null hypothesis?)

3. Does the actual proportion of 21 or over who said Yes lie in the confidence interval that you prepared? How about the proportion of 20 or younger who said Yes?