14.23. Independent random samples of 200 observations each are selected from each of three binomial populations A, B, C, with the following results.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>108</td>
<td>52</td>
<td>40</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>87</td>
<td>51</td>
<td>62</td>
<td>200</td>
</tr>
<tr>
<td>3</td>
<td>112</td>
<td>39</td>
<td>49</td>
<td>200</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>600</td>
</tr>
</tbody>
</table>

Test for a difference between the populations (warning the rows and columns are interchanged). \( \alpha = .01 \).

Write the expected values below the observed values.

\( H_0: \)
\[ df = \]

Acceptance interval for \( X^2: [ , ] \)

\( X^2 = \)

\( p\)-value interval = ( , )

Do any of the populations significantly differ?

14.25(a) \( X^2 = 18.5275 \), acceptance region \([0, 3.84146]\),

\( p\)-value interval = (.025, .05)

Accept H\(_0\). The populations are significantly different.

(b) \( p = \frac{(117+74)/(200+200)}{.4775} \approx .4775\)

\( SE = \sqrt{.4775 \times (1-.4775)(2/200)} = .0499\)

\( z = 4.304 \) acceptance [-1.96, 1.96]

14.29 \( X^2 = 5.491 \), acceptance region \([0, 5.99147]\),

\( p\)-value interval = (.05, .1)

Accept H\(_0\). The populations are not significantly different.