1. A study is done to estimate the average for a quantitative variable. With a random sample of size 100, the sample average is 65 and the sample SD is 15. What is the radius of a 98% confidence interval for the population average?

   a) 5.25   b) 2.42   c) 1.75   d) 3.53   e) 2.85

2. A sociological theory would predict that 90% of the families in a certain locality would own cars. A random sample is taken to test this theory. Out of the 600 families in the sample, 92% own cars. What is the P-value for this test?

   a) 2.63%   b) 5.82%   c) 3.41%   d) 6.42%   e) 4.95%

3. Theory says the average for a certain variable should be 200. You test this with a random sample of size 900. Your sample has an average of 204 and a standard deviation of 60. What is the P-value for this test?

   a) 1.38%   b) 2.28%   c) .82%   d) 1.73%   e) 2.49%

4. Theory says the average for a certain variable should be 250. A low budget study, using a sample of size 7, is done to test this. The sample has an average of 269 and a standard deviation of 15. What is the value of $t$ for this test?

   a) 3.10   b) 2.40   c) 3.60   d) 1.90   e) 3.80

5. What is the P-value for this test?

   a) < .5%   b) .5%–1%   c) 1%–2.5%   d) 2.5%–5%   e) 5%–10%

6. A weight-loss therapy is tested. There are 150 people in the treatment group and 140 in the control group. At the end of the treatment, the average weight for the treatment group is 194 lb. with an SD of 20 lb., and the average weight for the control group is 200 lb. with an SD of 22 lb. What is the P-value for this study?

   a) 1.38%   b) 2.28%   c) .82%   d) 1.73%   e) 2.49%
You test a die for fairness, rolling it 60 times. The outcomes are as follows:

<table>
<thead>
<tr>
<th>number on die</th>
<th>frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>16</td>
</tr>
</tbody>
</table>

7. What is the value of $\chi^2$ for this study?
   a) 11.52  b) 6.94  c) 10.54  d) 15.60  e) 17.62

8. What is the P-value for this test?
   a) 30%–50%  b) < 1%  c) 5%–10%  d) 1%–5%  e) 10%–30%

A botanist is crossing two strains of peas. Genetic theory says that $\frac{9}{16}$ of the offspring should be in group A, $\frac{3}{16}$ in group B, $\frac{3}{16}$ in group C, and $\frac{1}{16}$ in group D, provided the strains are pure.

He presents data for 160 offspring: 93 are in group A, 29 in group B, 29 in group C, and 9 in group D.

You run a $\chi^2$ test to see if his data looks to have been fudged.

9. What is the value of $\chi^2$ for this test?
   a) .27  b) 1.53  c) .73  d) .43  e) .52

10. What is the P-value for this test?
    a) 30%–50%  b) < 1%  c) 5%–10%  d) 1%–5%  e) 10%–30%

A study is made to see if voting and gender are independent. 100 men and 300 women are polled, to find out if they voted in the last election. The data obtained were as follows.

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voted</td>
<td>50</td>
<td>118</td>
</tr>
<tr>
<td>Didn’t vote</td>
<td>50</td>
<td>182</td>
</tr>
</tbody>
</table>

We study this data in the next two questions.

11. What is the value of $\chi^2$ for this study?
    a) 8.52  b) 1.02  c) 5.48  d) 2.54  e) 3.50

12. In what range is the value of $P$ for this study?
    a) 30%–50%  b) < 1%  c) 5%–10%  d) 1%–5%  e) 10%–30%
Theory predicts the SD for a variable should be 80. You take a random sample of size 10 to test this theory. The sample SD is 55.

13. What is the value of $\chi^2$ for this study?
   a) 3.62  b) 4.73  c) 1.85  d) 6.52  e) 2.36

14. In what range is the value of $P$ for this study?
   a) 30%–50%  b) < 1%  c) 5%–10%  d) 1%–5%  e) 10%–30%

15. You do a study to estimate the average and standard deviation for a certain variable. With a random sample of size 15, your sample has an average of 100 and a standard deviation of 20. Give a 90% confidence interval for the population SD.
   a) (15.91, 30.22)  b) (8.72, 42.63)  c) (17.32, 26.52)
   d) (12.41, 36.28)  e) (10.57, 38.52)