1. In a particular population, 64% of the people over 50 have been divorced at least once. You do a survey, taking a random sample of 100 people from this group. What is the probability that less than 60% of your sample have ever been divorced?
    a) $10\frac{1}{2}\%$  
    b) 24%  
    c) 20%  
    d) $14\frac{1}{2}\%$  
    e) $17\frac{1}{2}\%$

2. A study is done to estimate the average for a quantitative variable. With a random sample of size 200, the sample average is 85 and the sample SD is 20. What is the radius of a 90% confidence interval for the population average?
    a) 2.33  
    b) 4.51  
    c) 3.72  
    d) 5.24  
    e) 3.36

3. You do a poll to ascertain the popularity of a particular candidate in the primaries. Out of a sample of 500 voters, 35% say they will vote for this candidate. What is the radius of an 85% confidence interval for the percentage of all voters who intend to vote for this candidate?
    a) 2.87%  
    b) 4.15%  
    c) 3.72%  
    d) 3.09%  
    e) 2.54%

4. The 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 250 families in the sample, 94% own cars.
   
4. What is the standard error for this test?
    a) 2.36%  
    b) 1.90%  
    c) 2.16%  
    d) 3.28%  
    e) 2.76%
5. What is the P-value for this test?
    a) 2.56%  
    b) 4.42%  
    c) 5.48%  
    d) 7.12%  
    e) 1.79%

Theory says the average for a certain variable should be 175. You test this with a random sample of size 400. Your sample has an average of 178 and a standard deviation of 30.

6. What is the standard error for this test?
    a) 2.32  
    b) 1.50  
    c) 1.85  
    d) 1.34  
    e) 2.74
7. What is the P-value for this test?
    a) 2.56%  
    b) 5.48%  
    c) .89%  
    d) 2.28%  
    e) 4.36%
Theory says the average for a certain variable should be 550. A low budget study, using a sample of size 8, is done to test this. The sample has an average of 576 and a standard deviation of 20.

8. What is the value of $t$ for this test?
   a) 2.96  b) 3.72  c) 1.87  d) 2.34  e) 3.44

9. What is the P-value for this test?
   a) < .5%  b) .5%–1%  c) 1%–2.5%  d) 2.5%–5%  e) 5%–10%

A weight-loss therapy is tested. There are 75 people in the treatment group and 80 in the control group. At the end of the treatment, the average weight for the treatment group is 193 lb. with an SD of 20 lb., and the average weight for the control group is 200 lb. with an SD of 25 lb.

10. What is the value of the standard error for this study?
    a) 3.63  b) 3.35  c) 4.24  d) 2.92  e) 4.62

11. What is the P-value for this study?
    a) 5.48%  b) 1.36%  c) 2.56%  d) 4.42%  e) .89%

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>6</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
</tr>
</tbody>
</table>

12. What is the value of $\chi^2$ for this study?
    a) 6.80  b) 16.45  c) 12.40  d) 5.25  e) 10.60

13. What is the P-value for this test?
    a) 30%–50%  b) < 1%  c) 5%–10%  d) 1%–5%  e) 10%–30%
A scientist propounds a theory that 50% of a certain population should be in group A, 30% should be in group B, and 20% in group C. He presents survey data with the following frequencies:

<table>
<thead>
<tr>
<th>group</th>
<th>frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>55</td>
</tr>
<tr>
<td>B</td>
<td>27</td>
</tr>
<tr>
<td>C</td>
<td>18</td>
</tr>
</tbody>
</table>

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

14. What is the value of $\chi^2$ for this test?
   a) .09   b) .42   c) .18   d) 1.00   e) .01

15. 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. 200 men and 100 women are polled, to find out if they voted in the last election. The data obtained was as follows.

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voted</td>
<td>103</td>
<td>59</td>
</tr>
<tr>
<td>Didn’t vote</td>
<td>97</td>
<td>41</td>
</tr>
</tbody>
</table>

We study this data in the next two questions.

16. What is the value of $\chi^2$ for this study?
   a) 7.42   b) 1.51   c) 2.85   d) .82   e) 4.28

17. 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 50. You take a random sample of size 15 to test this theory. The sample SD is 63.

18. What is the value of $\chi^2$ for this study?
   a) 23.81   b) 16.82   c) 30.24   d) 14.25   e) 21.76

19. 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%
20. You do a study to estimate the average and standard deviation for a certain variable. With a random sample of size 20, your sample has an average of 200 and a standard deviation of 40. Give a 98% confidence interval for the population SD.

a) (32.42, 58.71)  
b) (25.24, 69.31)  
c) (29.74, 64.76)  
d) (22.81, 74.56)  
e) (35.45, 54.12)