

1. Identify the type of sampling used in each case. (Random, Cluster, Stratified, Systematic, or Convenience)
 - (a) A pollster selects drivers who are waiting to have their cars repaired at a local Sears Auto store. _____
 - (b) A pollster selects every 50th name in a telephone book. _____
 - (c) A pollster selects 100 men and 100 women. _____
 - (d) A pollster selects 50 people from each of 40 countries. _____
 - (e) A pollster writes the names of each voter on a card, shuffles the cards, then draws 25 names. _____

2. A legislative advisory committee consists of 20 Democrats (8 of whom are women) and 10 Republicans (3 of whom are women).
 - (a) Two of the committee members are randomly selected for a special research project. What is the probability that they are both Democrats? _____
 - (b) If the chairperson is randomly selected, find the probability of getting a Democrat or a man. _____
 - (c) At each meeting of this committee, one person is randomly chosen from the 30 members and that person must act as a secretary for the meeting. Find the probability that the first two meetings have male secretaries. _____
 - (d) If one of the committee members is randomly selected as treasurer, find the probability of getting a Republican. _____

3. Use your calculator to
 - (a) Evaluate ${}_{13}C_9$ _____
 - (b) Evaluate ${}_{12}P_3$ _____

4. A small company manufactures a new product and it is estimated that there is a 0.65 probability of making \$45,000, a 0.20 probability of losing \$30,000, and a 0.15 probability of breaking even. What is the expected value?

5. A bank's loan officer rates application for credit. The ratings are normally distributed with a mean of 200 and a standard deviation of 50.

- (a) If an applicant is randomly selected, find the probability of a rating that is between 200 and 275.

a. _____

- (b) If an applicant is randomly selected, find the probability of a rating that is below 250.

b. _____

- (c) If an applicant is randomly selected, find the probability of a rating that is above 300.

c. _____

- (d) If an applicant is randomly selected, find the probability of a rating that is between 170 and 220.

d. _____

- (e) If an applicant is randomly selected, find the probability of a rating that is above 178.

e. _____

- (f) If 40 different applicants are randomly selected, find the probability that their mean is above 215.

f. _____

6. We want to estimate the mean energy consumption level for a home in one region. We want to be 90% confident that our sample mean is within 25 kwh of the true population mean, and past data strongly suggest that the population standard deviation is 137 kwh. How large must our sample be?

7. A study of shark attacks on humans showed that 15 of 200 attacks occurred in deep water. Construct the 99% confidence interval for the true proportion of shark attacks that occur in deep water.

8. An educational testing company has been using a standard test of verbal ability and the mean has been 430. In analyzing a new version of that test, it is found that a sample of 100 randomly selected subjects produces a mean and a standard deviation of 424 and 155, respectively. At the 0.05 level of significance, test the claim that the new version has a mean equal to that of the past version.

Conclusion: _____

9. According to a Louis Harris poll, 63% of men and 67% of women drivers always use seat belts. Suppose these results are based on samples of 1200 men drivers and 1000 women drivers respectively. Test at the 0.01 significance level if the proportion of men drivers who always use seat belts is different from the proportion of women drivers who always use seat belts.

Conclusion: _____

10. Two separate tests are designed to measure employee productivity and dexterity. Several employees are randomly selected and tested with these results:

Productivity		25	27	30	23	23	27	28	32	36	38
Dexterity		51	53	61	44	49	55	57	65	69	77

- (a) Plot the scatter diagram on the bottom of this page.
- (b) Find the value of the linear correlation coefficient r . b. _____
- (c) Test the significance of the correlation coefficient r at a 5% significance level c. _____
- (d) Use the given sample data to find the estimated equation of the regression line. d. _____
- (e) Plot the regression line with the equation given in question (d). Plot that line on the same scatter diagram given in question (a).
- (f) Predict an employee's score on the dexterity test if he scored a 29 on the productivity test. f. _____

