



6) Construct a stem-and-leaf plot for the following data.

28	47	19	39	30	54	48	21	58	52
36	36	53	63	29	24	43	30	30	46

A)

1	9
2	1489
3	00066
4	36789
5	2348
6	3

B)

1	9
2	1489
3	00669
4	03678
5	2348
6	3

C)

1	9
2	1489
3	000669
4	3678
5	248
6	33

D)

1	9
2	1489
3	000669
4	3678
5	2348
6	3

7) Find the mean for the following data set:

28 14 25 19 20

8) Find the median for the following data set:

24 18 17 13 25

9) Find the mode for the following data set:

31 16 34 16 27

10) Find the sample standard deviation for the following data set:

25 23 17 16 30

11) Find the population standard deviation for the following data set:

21 12 20 15 18

12) Approximate the population variance given the following frequency distribution.

Class	Frequency
0 - 19	19
20 - 39	11
40 - 59	13
60 - 79	15
80 - 99	19

13) For the event described below, which of the following represents the complement of the event.

A sample of 301 software DVDs was selected. At least 34 of these were defective.

- A) Fewer than 34 DVDs were defective.                      B) At most 34 DVDs were defective.  
C) Exactly 34 DVDs were not defective.                      D) At most 267 DVDs were not defective.

14) A fast-food restaurant chain has 623 outlets in the United States. The following table categorizes them by city population and location and presents the number of outlets in each category. An outlet is chosen at random from the 623 to test market a new menu.

Population of city	Region			
	NE	SE	SW	NW
Under 50,000	30	26	27	19
50,000 - 500,000	60	48	50	39
Over 500,000	72	125	79	48

Given that the outlet is located in a city with a population under 50,000, what is the probability that it is in the Southwest?

15) A fair coin is tossed four times. What is the probability that the sequence of tosses is HHTT?

16) At the campus cafeteria, a diner can purchase a "meal deal" that consists of an entree, a side dish, and a dessert. There are 3 choices for the entree, 5 choices for the side dish, and 3 choices for dessert. How many different meal deals are possible?

17) On a TV game show, a contestant is shown 10 products from a grocery store and is asked to choose the three least-expensive items in the set, and then correctly arrange these three items in order of price. In how many ways can the contestant choose the three items?

- 18) Which one of the following data are discrete?
- A) the average preseason ranking of the University of Connecticut's women's basketball team over the past 10 years
  - B) the pre-season ranking of Duke University's men's basketball team
  - C) the average height of players on the University of Connecticut's women's basketball team
  - D) the height of the tallest player on Duke University's men's basketball team

- 19) Which one of the following data are continuous?
- A) the number of representatives of each species in the park
  - B) the number of species of trees in a park
  - C) the rankings of the trees, from most numerous to least numerous
  - D) the average height of a sample of trees

- 20) Determine the indicated probability for a binomial experiment with the given number of trials  $n$  and the given success probability  $p$ .  
 $n = 10, p = 0.4, P(8 \text{ or more})$

- 21) Determine the indicated probability for a binomial experiment with the given number of trials  $n$  and the given success probability  $p$ .  
 $n = 15, p = 0.4, P(12)$

- 22) Find the area under the standard normal curve that lies between  $z = 1.8$  and  $z = 2$ .

- 23) Find the area under the standard normal curve to the left of  $z = -0.7$ .

- 24) Find the area under the standard normal curve to the right of  $z = 1.6$ .

- 25) A population has a mean  $\mu = 21$  and standard deviation  $\sigma = 4$ . Find the  $z$ -score for a population value of 29.

- 26) A population has a mean  $\mu = 34$  and standard deviation  $\sigma = 17$ . Find the  $z$ -score for a population value of 26.

- 27) A researcher wants to construct a 98% confidence interval for the proportion of elementary school students in Seward County who receive free or reduced-price school lunches. What sample size is needed so that the confidence interval will have a margin of error of 0.09?

- 28) A simple random sample of kitchen toasters is to be taken to determine the mean operational lifetime in hours. Assume that the lifetimes are normally distributed with population standard deviation  $\sigma = 28$  hours.

Find the sample size needed so that a 95% confidence interval for the mean lifetime will have a margin of error of 4.

29) A paint manufacturer discovers that the mean volume of paint in a gallon-sized pail is 1 gallon with a standard deviation of 0.05 gallons. The paint volumes are approximately bell-shaped. Estimate the percent of pails with volumes between 0.90 gallons and 1.10 gallons.

30) A consumer advocacy group tested the "on-air" lifetimes a random sample of 162 cell phone batteries. The mean lifetime was 2.9 hours with a standard deviation of 0.4 hours. The lifetimes are approximately bell-shaped. Estimate the number of batteries with lifetimes between 2.1 hours and 3.7 hours.

31) A sample of size 39 will be drawn from a population with mean 26 and standard deviation 14. Find the probability that  $\bar{x}$  will be less than 29.

32) The mean number of pets per household is 3.25 with standard deviation 1.3. A sample of 59 households is drawn. Find the 74th percentile of the sample mean.

33) Determine whether the alternative hypothesis is left-tailed, right-tailed, or two-tailed.  
 $H_0: \mu = 11$        $H_1: \mu > 11$

34) Determine whether the outcome is a Type I error, a Type II error, or a correct decision.  
A test is made of  $H_0: \mu = 7$  versus  $H_1: \mu \neq 7$ . The true value of  $\mu$  is 5 and  $H_0$  is rejected.

35) A new organic pest control formula is being tested on potato plants to see whether it can reduce the level of potato beetle infestation. The mean number of beetles per untreated plant is 5. It is hoped that the new formula may reduce this infestation rate. State the appropriate null and alternate hypotheses.

36) A college admissions officer takes a simple random sample of 80 entering freshmen and computes their mean mathematics SAT score to be 469. Assume the population standard deviation is  $\sigma = 95$ .

Construct a 90% confidence interval for the mean mathematics SAT score for the entering freshmen class.

37) A sample of 132 tobacco smokers who recently completed a new smoking-cessation program were asked to rate the effectiveness of the program on a scale of 1 to 10, with 10 corresponding to "completely effective" and 1 corresponding to "completely ineffective". The average rating was 5.7 and the standard deviation was 4.7.

Construct a 95% confidence interval for the mean score.

38) In a survey of 314 registered voters, 156 of them wished to see Mayor Waffleskate lose her next election. Construct a 95% confidence interval for the proportion of registered voter who want to see Mayor Waffleskate defeated.

39) A test is made of  $H_0: \mu = 60$  versus  $H_1: \mu \neq 60$ . A sample of size  $n = 76$  is drawn, and  $\bar{x} = 66$ . The population standard deviation is  $\sigma = 22$ . Compute the value of the test statistic  $z$  and determine if  $H_0$  is rejected at the  $\alpha = 0.01$  level.

40) The mean annual tuition and fees for a sample of 12 private colleges was \$39,200 with a standard deviation of \$4300. A dotplot shows that it is reasonable to assume that the population is approximately normal. You wish to test whether the mean tuition and fees for private colleges is different from \$35,500.

- i). State the null and alternate hypotheses.
- ii). Compute the value of the test statistic and state the number of degrees of freedom.
- iii). State a conclusion regarding  $H_0$ . Use the  $\alpha = 0.05$  level of significance.

41) The mean annual tuition and fees for a sample of 12 private colleges was \$39,200 with a standard deviation of \$4300. A dotplot shows that it is reasonable to assume that the population is approximately normal. You wish to test whether the mean tuition and fees for private colleges is different from \$35,500.

- i). State the null and alternate hypotheses.
- ii). Compute the value of the test statistic and p-value.
- iii). State a conclusion regarding  $H_0$ . Use the  $\alpha = 0.05$  level of significance.

42) In a survey of 705 cigarette smokers, 50 of them reported that they have tried hypnosis therapy to try to quit smoking. Can you conclude that less than one-tenth of smokers have tried hypnosis therapy? Use the  $\alpha = 0.01$  level of significance.

43) Are low-fat diets or low-carb diets more effective for weight loss? A sample of 80 subjects went on a low-carbohydrate diet for six months. At the end of that time, the sample mean weight loss was 11.5 pounds with a sample standard deviation of 7.17 pounds. A second sample of 75 subjects went on a low-fat diet. Their sample mean weight loss was 17.9 with a standard deviation of 6.75. Can you conclude that the mean weight loss differed between the two diets? Use the  $\alpha = 0.05$  level.

- i). State the appropriate null and alternate hypotheses.
- ii). Compute the test statistic.
- iii). Do you reject  $H_0$ ? State a conclusion.

- 44) A study reported that in a sample of 104 people who watch television news, 35 had elevated diastolic blood pressure levels (in millimeters of mercury, or mmHg). In a sample of 74 people who do not watch television news, 20 had elevated diastolic blood pressure levels.

Can you conclude that the proportion of people with elevated diastolic blood pressure levels differs between news-watchers and those who do not watch news? Use the  $\alpha = 0.05$  level of significance.

Give the null and alternate hypotheses, test statistic, and p-value to support your answer.

- 45) In an experiment to determine whether there is a systematic difference between the weights obtained with two different mass balances, six specimens were weighed, in grams, on each balance. The following data were obtained:

Specimen	A	B
1	6.40	6.40
2	7.92	7.92
3	8.35	8.35
4	6.03	6.00
5	9.31	9.30
6	5.80	5.81

Can you conclude that the mean weight differs between the two balances?

- State the null and alternate hypotheses.
- Compute the test statistic.
- State a conclusion using the  $\alpha = 0.02$  level of significance.

- 46) For the following data set, compute the coefficient of determination.

$x$	3	7	1	4	6	2
$y$	9	20	21	19	22	12

- 47) For the following data set, compute the coefficient of determination.

$x$	9	10	2	1	3	7
$y$	24	33	29	21	32	33

48) Compute the least-squares regression line for the given data set.

$x$	2	3	4	5	6	7
$y$	17.1	18.6	22.7	23.4	25.3	29

49) Compute the least-squares regression line for the given data set.

$x$	2	3	4	5	6	7
$y$	3.1	-0.7	-2.8	-2.7	-4.9	-8.4

50) For the given table of observed frequencies, perform a test for independence, using the  $\alpha = 0.01$  level of significance.

	1	2	3
A	69	64	67
B	91	98	88
C	42	84	86

51) For the given table of observed frequencies:

	1	2	3
A	60	56	48
B	89	82	94
C	50	98	92

- Compute the row totals, the column totals, and the grand total.
- Construct the corresponding table of expected values.
- Compute the value of the chi-square test statistic.
- Perform a test for independence, using the  $\alpha = 0.01$  level of significance.