

1. The average monthly electric bill of a random sample of 256 residents of a city is \$90 with a standard deviation of \$24.
 - a. Construct a 90% confidence interval for the mean monthly electric bills of all residents.
 - b. Construct a 95% confidence interval for the mean monthly electric bills of all residents.

Answers:

- a. 87.5325 to 92.4675
- b. 87.06 to 92.94

2. In a random sample of 400 registered voters, 120 indicated they plan to vote for Candidate A. Determine a 95% confidence interval for the proportion of all the registered voters who will vote for Candidate A.

Answer:

0.255 to 0.345

3. A sample of 100 cans of coffee showed an average weight of 13 ounces with a standard deviation of 0.8 ounces.
 - a. Construct a 95% confidence interval for the mean of the population.

Answers:

- a. 12.8432 to 13.1568

4. A random sample of 121 checking accounts at a bank showed an average daily balance of \$300 and a standard deviation of \$44. Develop a 95% confidence interval estimate for the mean of the population.

Answer:

\$292.16 to \$307.84

5. A sample of 51 observations will be taken from an infinite population. The population proportion equals 0.85. The probability that the sample proportion will be between 0.9115 and 0.946 is

- a. 0.8633
- b. 0.6900
- c. 0.0819
- d. 0.0345

Answer: c

6. A finite population correction factor is needed in computing the standard deviation of the sampling distribution of sample means
- whenever the population is infinite
 - whenever the sample size is more than 5% of the population size
 - whenever the sample size is less than 5% of the population size
 - The correction factor is not necessary if the population has a normal distribution

Answer: b

7. Four hundred people were asked whether gun laws should be more stringent. Three hundred said "yes," and 100 said "no." The point estimate of the proportion in the population who will respond "yes" is
- 300
 - approximately 300
 - 0.75
 - 0.25

Answer: c

8. A population has a mean of 300 and a standard deviation of 18. A sample of 144 observations will be taken. The probability that the sample mean will be between 297 to 303 is
- 0.4332
 - 0.8664
 - 0.9332
 - 0.0668

Answer: b

9. A population of 1,000 students spends an average of \$10.50 a day on dinner. The standard deviation of the expenditure is \$3. A simple random sample of 64 students is taken.
- What are the expected value, standard deviation, and shape of the sampling distribution of the sample mean?
 - What is the probability that these 64 students will spend a combined total of more than \$715.21?
 - What is the probability that these 64 students will spend a combined total between \$703.59 and \$728.45?

Answers:

- 10.5 0.363 normal
- 0.0314
- 0.0794

10. The life expectancy in the United States is 75 with a standard deviation of 7 years. A random sample of 49 individuals is selected.
- What is the probability that the sample mean will be larger than 77 years?
 - What is the probability that the sample mean will be less than 72.7 years?
 - What is the probability that the sample mean will be between 73.5 and 76 years?
 - What is the probability that the sample mean will be between 72 and 74 years?
 - What is the probability that the sample mean will be larger than 73.46 years?

Answers:

- 0.0228
- 0.0107
- 0.7745
- 0.1573
- 0.9389

11. The SAT scores have an average of 1200 with a standard deviation of 60. A sample of 36 scores is selected.
- What is the probability that the sample mean will be larger than 1224?
 - What is the probability that the sample mean will be less than 1230?
 - What is the probability that the sample mean will be between 1200 and 1214?
 - What is the probability that the sample mean will be greater than 1200?
 - What is the probability that the sample mean will be larger than 73.46?

Answers:

- 0.0082
- 0.9986
- 0.4192
- 0.5
- 1.0

12. MNM Corporation gives each of its employees an aptitude test. The scores on the test are normally distributed with a mean of 75 and a standard deviation of 15. A simple random sample of 25 is taken from a population of 500.
- What are the expected value, the standard deviation, and the shape of the sampling distribution of \bar{x} ?
 - What is the probability that the average aptitude test in the sample will be between 70.14 and 82.14?
 - What is the probability that the average aptitude test in the sample will be greater than 82.68?
 - What is the probability that the average aptitude test in the sample will be less than 78.69?
 - Find a value, C, such that $P(\bar{x} \geq C) = .015$.

Answers:

- 75; 3; normal
- 0.9387
- 0.0052
- 0.8907
- 81.51

13. Michael is running for president. The proportion of voters who favor Michael is 0.8. A simple random sample of 100 voters is taken.
- What are the expected value, standard deviation, and shape of the sampling distribution of \bar{p} ?
 - What is the probability that the number of voters in the sample who will not favor Michael will be between 26 and 30?
 - What is the probability that the number of voters in the sample who will not favor Michael will be more than 16?

Answers:

- 0.8; 0.04; normal
- 0.0606
- 0.8413

14. In a restaurant, the proportion of people who order coffee with their dinner is 0.9. A simple random sample of 144 patrons of the restaurant is taken.
- What are the expected value, standard deviation, and shape of the sampling distribution of \bar{p} ?
 - What is the probability that the proportion of people who will order coffee with their meal is between 0.85 and 0.875?
 - What is the probability that the proportion of people who will order coffee with their meal is at least 0.945?

Answers:

- 0.9; 0.025; normal
- 0.1359
- 0.0359

15. A random sample of nine telephone calls in an office provided the following information:

Call Number	Duration (In Minutes)	Type of Call
1	3	local
2	8	long distance
3	4	local
4	3	local
5	5	long distance
6	6	local
7	3	local
8	5	local
9	8	local

- Determine the point estimate for the average duration of all calls.
- What is the point estimate for the standard deviation of the population?
- Determine the standard error of the mean.
- What is the point estimate for the proportion of all calls that were long distance?
- Determine the standard error of proportion.

Answers:

- 5
- 2
- 0.67
- 0.222
- 0.138

16. An automotive repair shop has determined that the average service time on an automobile is 2 hours with a standard deviation of 32 minutes. A random sample of 64 services is selected.
- What is the probability that the sample of 64 will have a mean service time greater than 114 minutes?
 - Assume the population consists of 400 services. Determine the standard error of the mean.

Answers:

- 0.9332
- 3.67

17. There are 8,000 students at the University of Tennessee at Chattanooga. The average age of all the students is 24 years with a standard deviation of 9 years. A random sample of 36 students is selected.
- Determine the standard error of the mean.
 - What is the probability that the sample mean will be larger than 19.5?
 - What is the probability that the sample mean will be between 25.5 and 27 years?

Answers:

- 1.5
- 0.9986
- 0.1359

18. In a local university, 10% of the students live in the dormitories. A random sample of 100 students is selected for a particular study.
- What is the probability that the sample proportion (the proportion living in the dormitories) is between 0.172 and 0.178?
 - What is the probability that the sample proportion (the proportion living in the dormitories) is greater than 0.025?

Answers:

- 0.0035
- 0.9938

19. A department store has determined that 25% of all their sales are credit sales. A random sample of 75 sales is selected.
- What is the probability that the sample proportion will be greater than 0.34?
 - What is the probability that the sample proportion will be between 0.196 and 0.354?
 - What is the probability that the sample proportion will be less than 0.25?
 - What is the probability that the sample proportion will be less than 0.10?

Answers:

- 0.0359
- 0.8411
- 0.5
- 0.0014

20. Ten percent of the items produced by a machine are defective. A random sample of 100 items is selected and checked for defects.
- Determine the standard error of the proportion.
 - What is the probability that the sample will contain more than 2.5% defective units?
 - What is the probability that the sample will contain more than 13% defective units?

Answers:

- 0.03
- 0.9938
- 0.1587

21. In a poll of 600 voters in a campaign to eliminate non-returnable beverage containers, 210 of the voters were opposed. Develop a 92% confidence interval estimate for the proportion of all the voters who opposed the container control bill.

Answer:

0.316 to 0.384

22. The Highway Safety Department wants to study the driving habits of individuals. A sample of 121 cars traveling on the highway revealed an average speed of 60 miles per hour with a standard deviation of 11 miles per hour. Determine a 95% confidence interval estimate for the speed of all cars.

Answer:

58.04 to 61.96

23. A random sample of 100 credit sales in a department store showed an average sale of \$120.00. From past data, it is known that the standard deviation of the population is \$40.00.
- Determine the standard error of the mean.
 - With a 0.95 probability, determine the margin of error.
 - What is the 95% confidence interval of the population mean?

Answers:

- 4
- 7.84
- 112.16 to 127.84

24. A professor at a local university noted that the grades of her students were normally distributed with a mean of 78 and a standard deviation of 10.
- The professor has informed us that 16.6 percent of her students received grades of A. What is the minimum score needed to receive a grade of A?
 - If 12.1 percent of her students failed the course and received F's, what was the maximum score among those who received an F?
 - If 33 percent of the students received grades of B or better (i.e., A's and B's), what is the minimum score of those who received a B?

Answers:

- 87.7
- 66.3
- 82.4

25. The miles-per-gallon obtained by the 1995 model Z cars is normally distributed with a mean of 22 miles-per-gallon and a standard deviation of 5 miles-per-gallon.
- What is the probability that a car will get between 13.35 and 35.1 miles-per-gallon?
 - What is the probability that a car will get more than 29.6 miles-per-gallon?
 - What is the probability that a car will get less than 21 miles-per-gallon?
 - What is the probability that a car will get exactly 22 miles-per-gallon?

Answers:

- 0.9538
- 0.0643
- 0.4207
- 0.0000

26. The salaries at a corporation are normally distributed with an average salary of \$19,000 and a standard deviation of \$4,000.
- What is the probability that an employee will have a salary between \$12,520 and \$13,480?
 - What is the probability that an employee will have a salary more than \$11,880?
 - What is the probability that an employee will have a salary less than \$28,440?

Answers:

- 0.0312
- 0.9625
- 0.9909