

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Assume that X has a normal distribution, and find the indicated probability.

- 1) The mean is $\mu = 15.2$ and the standard deviation is $\sigma = 0.9$. $P(X > 16.1)$.
A) 0.1587 B) 0.8413 C) 0.1357 D) 0.1550

Find the indicated probability.

- 2) The volumes of soda in quart soda bottles are normally distributed with a mean of 32.3 oz and a standard deviation of 1.2 oz. What is the probability that the volume of soda in a randomly selected bottle will be less than 32 oz?
A) 0.0987 B) 0.3821 C) 0.4013 D) 0.5987

Estimate the indicated probability by using the normal distribution as an approximation to the binomial distribution.

- 3)
In one county, the conviction rate for speeding is 85%. Estimate the probability that of the next 100 speeding summonses issued, there will be at least 90 convictions.
A) 0.1038 B) 0.8962 C) 0.0420 D) 0.3962

If Z is a standard normal variable, find the probability.

- 4) The probability that Z is greater than -1.82
A) 0.9656 B) -0.0344 C) 0.0344 D) 0.4656

Solve the problem.

- 5) For a standard normal distribution, find the percentage of data that are more than 2 standard deviations below the mean or more than 3 standard deviations above the mean.
A) 2.41% B) 0.26% C) 4.56% D) 97.59%

6)

The scores on a certain test are normally distributed with a mean score of 70 and a standard deviation of 3. What is the probability that a sample of 90 students will have a mean score of at least 70.3162?

A) 0.3413 B) 0.8413 C) 0.1587 D) 0.3174

7) Scores on a test have a mean of 67 and standard deviation is 85. The scores have a distribution that is approximately normal. Find the standard deviation. Round your answer to the nearest tenth.

A) 13.5 B) 12.1 C) 26.9 D) 24

8) A math teacher gives two different tests to measure students' aptitude for math. Scores on the first test are normally distributed with a mean of 23 and a standard deviation of 4.3. Scores on the second test are normally distributed with a mean of 69 and a standard deviation of 10.2. Assume that the two tests use different scales to measure the same aptitude. If a student scores 28 on the first test, what would be his equivalent score on the second test? (That is, find the score that would put him in the same percentile.)

A) 82 B) 81 C) 74 D) 79

9) IQ scores are normally distributed with a mean of 100 and a standard deviation of 15. In a random sample of 9000, approximately how many people will have IQs between 85 and 120?

A) 750 B) 6746 C) 3674 D) 6143

10) Find the critical value z_{α} that corresponds to a degree of confidence of 91%.
A) 1.645 B) 1.70 C) 1.34 D) 1.75

11) Assume that z scores are normally distributed with a mean of 0 and a standard deviation of 1. If $P(-a < z < a) = 0.4314$, find a.
A) 1.49 B) 0.3328 C) -0.18 D) 0.57

12) Human body temperatures are normally distributed with a mean of 98.20°F and a standard deviation of 0.62°F. Find the temperature that separates the top 7% from the bottom 93%.
A) 98.78°F B) 99.12°F C) 97.28°F D) 98.40°F

13)
The amount of snowfall falling in a certain mountain range is normally distributed with a mean of 76 inches, and a standard deviation of 14 inches. What is the probability that the mean annual snowfall during 49 randomly picked years will exceed 78.8 inches?
A) 0.0808 B) 0.5808 C) 0.0026 D) 0.4192

The Precision Scientific Instrument Company manufactures thermometers that are supposed to give readings of 0°C at the freezing point of water. Tests on a large sample of these thermometers reveal that at the freezing point of water, some give readings below 0°C (denoted by negative numbers) and some give readings above 0°C (denoted by positive numbers). Assume that the mean reading is 0°C and the standard deviation of the readings is 1.00°C . Also assume that the frequency distribution of errors closely resembles the normal distribution. A thermometer is randomly selected and tested. Find the temperature reading corresponding to the given information.

14) Find P_{40} , the 40th percentile.

A) -0.57° B) 0.57° C) -0.25° D) 0.25°

Use the continuity correction and describe the region of the normal curve that corresponds to the indicated binomial probability.

15) The probability of fewer than 43 democrats

A) The area to the right of 43.5 B) The area to the left of 43

C) The area to the left of 42.5 D) The area to the left of 43.5

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ .

16)

A random sample of 105 light bulbs had a mean life of $\bar{x} = 438$ hours with a standard deviation of $s = 39$ hours. Construct a 90 percent confidence interval for the mean life, μ , of all light bulbs of this type.

A) (432, 444) B) (428, 448) C) (431, 445) D) (429, 447)

Find the indicated probability.

17) In one region, the September energy consumption levels for single-family homes are found to be normally distributed with a mean of 1050 kWh and a standard deviation of 218 kWh. For a randomly selected home, find the probability that the September energy consumption level is between 1100 kWh and 1225 kWh.

A) 0.2881 B) 0.1971 C) 0.0910 D) 0.3791

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) A

2) C

3) A

4) A

5) A

6) C

7) C

8) B

9) B

10) B

11) D

12) B

13) A

14) C

15) C

16) A

17) B