

## SS 03 Quantitative Methods: Application

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### Question #1 of 193

Question ID: 413226

Assume an investor purchases a stock for \$50. One year later, the stock is worth \$60. After one more year, the stock price has fallen to the original price of \$50. Calculate the continuously compounded return for year 1 and year 2.

- |    | <u>Year 1</u> | <u>Year 2</u> |
|----|---------------|---------------|
| A) | 18.23%        | -18.23%       |
| B) | -18.23%       | -18.23%       |
| C) | 18.23%        | 16.67%        |

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### Question #2 of 193

Question ID: 434210

#### Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373

The approximate 99% confidence interval for the population mean based on a sample of 60 returns with a mean of 7% and a sample standard deviation of 25% is *closest* to:

- A) 0.546% to 13.454%.
- B) -1.584% to 15.584%.
- C) 1.584% to 14.584%.

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### Question #3 of 193

Question ID: 434204

Assume 30% of the CFA candidates have a degree in economics. A random sample of three CFA candidates is selected. What is the probability that none of them has a degree in economics?

- A) 0.027.
- B) 0.343.

C) 0.900.

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### Question #4 of 193

Question ID: 413257

If the true mean of a population is 16.62, according to the central limit theorem, the mean of the distribution of sample means, for all possible sample sizes  $n$  will be:

- A)  $16.62 / \sqrt{n}$ .
  - B) indeterminate for sample with  $n < 30$ .
  - C) 16.62.
- 

### Question #5 of 193

Question ID: 413312

An article in a trade journal suggests that a strategy of buying the seven stocks in the S&P 500 with the highest earnings-to-price ratio at the end of the calendar year and holding them until March 20 of the following year produces significant trading profits. Upon reading further, you discover that the study is based on data from 1993 to 1997, and the earnings-to-price ratio is calculated using the stock price on December 31 of each year and the annual reported earnings per share for that year. Which of the following biases is *least likely* to influence the reported results?

- A) Time-period bias.
  - B) Survivorship bias.
  - C) Look-ahead bias.
- 

### Question #6 of 193

Question ID: 413212

The mean and standard deviation of returns on three portfolios are listed below in percentage terms:

- Portfolio X: Mean 5%, standard deviation 3%.
- Portfolio Y: Mean 14%, standard deviation 20%.
- Portfolio Z: Mean 19%, standard deviation 28%.

Using Roy's safety first criteria and a threshold of 3%, which of these is the optimal portfolio?

- A) Portfolio Z.
  - B) Portfolio Y.
  - C) Portfolio X.
-

### Question #7 of 193

Question ID: 413234

Joan Biggs, CFA, acquires a large database of past returns on a variety of assets. Biggs then draws random samples of sets of returns from the database and analyzes the resulting distributions. Biggs is engaging in:

- A) discrete analysis.
  - B) historical simulation.
  - C) Monte Carlo simulation.
- 

### Question #8 of 193

Question ID: 413278

Which of the following statements about confidence intervals is *least* accurate? A confidence interval:

- A) expands as the probability that a point estimate falls within the interval decreases.
  - B) has a significance level that is equal to one minus the degree of confidence.
  - C) is constructed by adding and subtracting a given amount from a point estimate.
- 

### Question #9 of 193

Question ID: 710142

Consider a random variable  $X$  that follows a continuous uniform distribution:  $7 \leq X \leq 20$ . Which of the following statements is *least* accurate?

- A)  $F(10) = 0.23$ .
  - B)  $F(12 \leq X \leq 16) = 0.307$ .
  - C)  $F(21) = 0.00$ .
- 

### Question #10 of 193

Question ID: 413259

Frank Grinder is trying to introduce sampling into the quality control program of an old-line manufacturer. Grinder samples 38 items and finds that the standard deviation in size is 0.019 centimeters. What is the standard error of the sample mean?

- A) 0.00204.
  - B) 0.00308.
  - C) 0.00615.
- 

### Question #11 of 193

Question ID: 413293

The average U.S. dollar/Euro exchange rate from a sample of 36 monthly observations is \$1.00/Euro. The population variance is 0.49. What is the 95% confidence interval for the mean U.S. dollar/Euro exchange rate?

- A) \$0.8075 to \$1.1925.
  - B) \$0.7713 to \$1.2287.
  - C) \$0.5100 to \$1.4900.
- 

### Question #12 of 193

Question ID: 413186

Which of the following would *least likely* be categorized as a multivariate distribution?

- A) The returns of the stocks in the DJIA.
  - B) The return of a stock and the return of the DJIA.
  - C) The days a stock traded and the days it did not trade.
- 

### Question #13 of 193

Question ID: 413137

A probability distribution is *least likely* to:

- A) contain all the possible outcomes.
  - B) have only non-negative probabilities.
  - C) give the probability that the distribution is realistic.
- 

### Question #14 of 193

Question ID: 413158

Which of the following could be the set of all possible outcomes for a random variable that follows a binomial distribution?

- A) (-1, 0, 1).
  - B) (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11).
  - C) (1, 2).
- 

### Question #15 of 193

Question ID: 413147

Which of the following could *least likely* be a probability function?

- A)  $X:(1,2,3,4) p(x) = 0.2$ .
- B)  $X:(1,2,3,4) p(x) = x / 10$ .
- C)  $X:(1,2,3,4) p(x) = (x \times x) / 30$ .

### Question #16 of 193

Question ID: 413287

The table below is for five samples drawn from five separate populations. The far left columns give information on the population distribution, population variance, and sample size. The right-hand columns give three choices for the appropriate tests: Z = z-statistic, and t = t-statistic. "None" means that a test statistic is not available.

Sampling From			Test Statistic Choices		
Distribution	Variance	n	One	Two	Three
Normal	5.60	75	Z	Z	Z
Non-normal	n/a	45	Z	t	t
Normal	n/a	1000	Z	t	t
Non-normal	14.3	15	t	none	t
Normal	0.056	10	Z	Z	t

Which set of test statistic choices (One, Two, or Three) matches the correct test statistic to the sample for all five samples?

- A) Two.
- B) One.
- C) Three.

### Question #17 of 193

Question ID: 413190

The mean return of a portfolio is 20% and its standard deviation is 4%. The returns are normally distributed. Which of the following statements about this distribution are *least* accurate? The probability of receiving a return:

- A) of less than 12% is 0.025.
- B) in excess of 16% is 0.16.
- C) between 12% and 28% is 0.95.

### Question #18 of 193

Question ID: 413224

Given a holding period return of  $R$ , the continuously compounded rate of return is:

- A)  $e^R - 1$ .
  - B)  $\ln(1 + R)$ .
  - C)  $\ln(1 - R) - 1$ .
- 

### Question #19 of 193

Question ID: 413316

A research paper that reports finding a profitable trading strategy without providing any discussion of an economic theory that makes predictions consistent with the empirical results is *most likely* evidence of:

- A) a sample that is not large enough.
  - B) a non-normal population distribution.
  - C) data mining.
- 

### Question #20 of 193

Question ID: 434206

The safety-first criterion focuses on:

- A) SEC regulations.
  - B) shortfall risk.
  - C) margin requirements.
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### Question #21 of 193

Question ID: 413164

A stock priced at \$20 has an 80% probability of moving up and a 20% probability of moving down. If it moves up, it increases by a factor of 1.05. If it moves down, it decreases by a factor of  $1/1.05$ . What is the expected stock price after two successive periods?

- A) \$22.05.
  - B) \$21.24.
  - C) \$20.05.
- 

### Question #22 of 193

Question ID: 413166

A total return index begins the year at 1350.23 and ends the year at 1412.95. A portfolio that tracks this index earns a total return

of 3.65% for the year. The tracking error of this portfolio is *closest* to:

- A) -1.0%.
- B) 4.7%.
- C) 0.9%.

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### Question #23 of 193

Question ID: 413142

A random variable that has a countable number of possible values is called a:

- A) continuous random variable.
- B) probability distribution.
- C) discrete random variable.

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### Question #24 of 193

Question ID: 652911

#### Cumulative Z-Table

z	0.05	0.06	0.07	0.08	0.09
2.4	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9970	0.9971	0.9972	0.9973	0.9974

The average return on the Russell 2000 index for 121 monthly observations was 1.5%. The population standard deviation is assumed to be 8.0%. What is a 99% confidence interval for the mean monthly return on the Russell 2000 index?

- A) -0.4% to 3.4%.
- B) 0.1% to 2.9%.
- C) -6.5% to 9.5%.

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### Question #25 of 193

Question ID: 413146

If a smooth curve is to represent a probability density function, what two requirements must be satisfied? The area under the curve must be:

- A) one and the curve must not fall below the horizontal axis.
- B) one and the curve must not rise above the horizontal axis.
- C) zero and the curve must not fall below the horizontal axis.

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**Question #26 of 193**

Question ID: 413238

An analyst wants to generate a simple random sample of 500 stocks from all 10,000 stocks traded on the New York Stock Exchange, the American Stock Exchange, and NASDAQ. Which of the following methods is *least likely* to generate a random sample?

- A) Using the 500 stocks in the S&P 500.
  - B) Listing all the stocks traded on all three exchanges in alphabetical order and selecting every 20th stock.
  - C) Assigning each stock a unique number and generating a number using a random number generator. Then selecting the stock with that number for the sample and repeating until there are 500 stocks in the sample.
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**Question #27 of 193**

Question ID: 413317

The practice of repeatedly using the same database to search for patterns until one is found is called:

- A) data mining.
  - B) data snooping.
  - C) sample selection bias.
- 

**Question #28 of 193**

Question ID: 413145

In a continuous probability density function, the probability that any single value of a random variable occurs is equal to what?

- A) Zero.
  - B)  $1/N$ .
  - C) One.
- 

**Question #29 of 193**

Question ID: 434219

Student's *t*-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001



40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373

The average salary for a sample of 61 CFA charterholders with 10 years experience is \$200,000, and the sample standard deviation is \$80,000. Assume the population is normally distributed. Which of the following is a 99% confidence interval for the population mean salary of CFA charterholders with 10 years of experience?

- A) \$172,514 to \$227,486.
- B) \$172,754 to \$227,246.
- C) \$160,000 to \$240,000.

### Question #30 of 193

Question ID: 413251

Which of the following statements regarding the central limit theorem (CLT) is *least* accurate? The CLT:

- A) states that for a population with mean  $\mu$  and variance  $\sigma^2$ , the sampling distribution of the sample means for any sample of size  $n$  will be approximately normally distributed.
- B) holds for any population distribution, assuming a large sample size.
- C) gives the variance of the distribution of sample means as  $\sigma^2 / n$ , where  $\sigma^2$  is the population variance and  $n$  is the sample size.

### Question #31 of 193

Question ID: 413185

A multivariate distribution:

- A) gives multiple probabilities for the same outcome.
- B) applies only to binomial distributions.
- C) specifies the probabilities associated with groups of random variables.

### Question #32 of 193

Question ID: 413228

Over a period of one year, an investor's portfolio has declined in value from 127,350 to 108,427. What is the continuously compounded rate of return?

- A) -13.84%.
- B) -16.09%.
- C) -14.86%.

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**Question #33 of 193**

Question ID: 413315

The average mutual fund return calculated from a sample of funds with significant survivorship bias would *most likely* be:

- A) larger than the mean return of the population of all mutual funds.
  - B) smaller than the mean return of the population of all mutual funds.
  - C) an unbiased estimate of the mean return of the population of all mutual funds if the sample size was large enough.
- 

**Question #34 of 193**

Question ID: 413208

Which of the following portfolios provides the best "safety first" ratio if the minimum acceptable return is 6%?

Portfolio	Expected Return (%)	Standard Deviation (%)
1	13	5
2	11	3
3	9	2

- A) 1.
  - B) 2.
  - C) 3.
- 

**Question #35 of 193**

Question ID: 413242

A sample of five numbers drawn from a population is (5, 2, 4, 5, 4). Which of the following statements concerning this sample is *most* accurate?

- A) The sampling error of the sample is equal to the standard error of the sample.
  - B) The mean of the sample is  $\sum X / (n - 1) = 5$ .
  - C) The variance of the sample is:  $\sum (x_1 - \text{mean of the sample})^2 / (n - 1) = 1.5$ .
- 

**Question #36 of 193**

Question ID: 413167

A portfolio begins the year with a value of \$100,000 and ends the year with a value of \$95,000. The manager's performance is measured against an index that declined by 7% on a total return basis during the year. The tracking error of this portfolio is

closest to:

- A) -5%.
  - B) -2%.
  - C) 2%.
- 

### Question #37 of 193

Question ID: 413241

Which of the following statements about sampling errors is *least* accurate?

- A) Sampling errors are errors due to the wrong sample being selected from the population.
  - B) Sampling error is the error made in estimating the population mean based on a sample mean.
  - C) Sampling error is the difference between a sample statistic and its corresponding population parameter.
- 

### Question #38 of 193

Question ID: 413248

An analyst is asked to calculate standard deviation using monthly returns over the last five years. These data are *best* described as:

- A) time series data.
  - B) cross-sectional data.
  - C) systematic sampling data.
- 

### Question #39 of 193

Question ID: 413196

If a stock's return is normally distributed with a mean of 16% and a standard deviation of 50%, what is the probability of a negative return in a given year?

- A) 0.3745.
  - B) 0.5000.
  - C) 0.0001.
- 

### Question #40 of 193

Question ID: 413204

The standard normal distribution is *most* completely described as a:

- A) symmetrical distribution with a mean equal to its median.
  - B) distribution that exhibits zero skewness and no excess kurtosis.
  - C) normal distribution with a mean of zero and a standard deviation of one.
- 

### Question #41 of 193

Question ID: 413207

The mean and standard deviation of returns for three portfolios are listed below in percentage terms.

Portfolio X: Mean 5%, standard deviation 3%.

Portfolio Y: Mean 14%, standard deviation 20%.

Portfolio Z: Mean 19%, standard deviation 28%.

Using Roy's safety-first criteria and a threshold of 4%, select the optimal portfolio.

- A) Portfolio X.
  - B) Portfolio Y.
  - C) Portfolio Z.
- 

### Question #42 of 193

Question ID: 413314

A study reports that from 2002 to 2004 the average return on growth stocks was twice as large as that of value stocks. These results *most likely* reflect:

- A) survivorship bias.
  - B) look-ahead bias.
  - C) time-period bias.
- 

### Question #43 of 193

Question ID: 413260

Joseph Lu calculated the average return on equity for a sample of 64 companies. The sample average is 0.14 and the sample standard deviation is 0.16. The standard error of the mean is *closest* to:

- A) 0.0025.
  - B) 0.1600.
  - C) 0.0200.
-

### Question #44 of 193

Question ID: 413300

A local high school basketball team had 18 home games this season and averaged 58 points per game. If we assume that the number of points made in home games is normally distributed, which of the following is *most likely* the range of points for a confidence interval of 90%?

- A) 26 to 80.
  - B) 24 to 78.
  - C) 34 to 82.
- 

### Question #45 of 193

Question ID: 413295

A traffic engineer is trying to measure the effects of carpool-only lanes on the expressway. Based on a sample of 1,000 cars at rush hour, he finds that the mean number of occupants per car is 2.5, with a standard deviation of 0.4. Assuming that the population is normally distributed, what is the confidence interval at the 5% significance level for the number of occupants per car?

- A) 2.475 to 2.525.
  - B) 2.288 to 2.712.
  - C) 2.455 to 2.555.
- 

### Question #46 of 193

Question ID: 413281

When is the t-distribution the appropriate distribution to use? The t-distribution is the appropriate distribution to use when constructing confidence intervals based on:

- A) small samples from populations with known variance that are at least approximately normal.
  - B) small samples from populations with unknown variance that are at least approximately normal.
  - C) large samples from populations with known variance that are nonnormal.
- 

### Question #47 of 193

Question ID: 413133

Which of the following statements about probability distributions is *most* accurate?

- A) A discrete uniform random variable has varying probabilities for each outcome that total to one.
- B) A binomial distribution counts the number of successes that occur in a fixed number of independent trials that have mutually exclusive (i.e. yes or no) outcomes.
- C) A continuous uniform distribution has a lower limit but no upper limit.

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**Question #48 of 193**

Question ID: 413253

According to the Central Limit Theorem, the distribution of the sample means is approximately *normal* if:

- A) the underlying population is normal.
  - B) the standard deviation of the population is known.
  - C) the sample size  $n > 30$ .
- 

**Question #49 of 193**

Question ID: 413140

Which of the following is *least likely* a probability distribution?

- A) Zeta Corp.:  $P(\text{dividend increases}) = 0.60$ ,  $P(\text{dividend decreases}) = 0.30$ .
  - B) Roll an irregular die:  $p(1) = p(2) = p(3) = p(4) = 0.2$  and  $p(5) = p(6) = 0.1$ .
  - C) Flip a coin:  $P(H) = P(T) = 0.5$ .
- 

**Question #50 of 193**

Question ID: 413322

When sampling from a population, the *most* appropriate sample size:

- A) involves a trade-off between the cost of increasing the sample size and the value of increasing the precision of the estimates.
  - B) minimizes the sampling error and the standard deviation of the sample statistic around its population value.
  - C) is at least 30.
- 

**Question #51 of 193**

Question ID: 434214

**Student's t-Distribution**

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
24	1.318	1.711	2.064	2.492	2.797	3.745
25	1.316	1.708	2.060	2.485	2.787	3.725
26	1.315	1.706	2.056	2.479	2.779	3.707

27	1.314	1.703	2.052	2.473	2.771	3.690
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Books Fast, Inc., prides itself on shipping customer orders quickly. Books Fast sampled 27 of its customers within a 200-mile radius and found a mean delivery time of 76 hours, with a sample standard deviation of 6 hours. Based on this sample and assuming a normal distribution of delivery times, what is the confidence interval for the mean delivery time at 5% significance?

- A) 65.75 to 86.25 hours.
- B) 73.63 to 78.37 hours.
- C) 68.50 to 83.50 hours.

### Question #52 of 193

Question ID: 413229

A stock increased in value last year. Which will be greater, its continuously compounded or its holding period return?

- A) Neither, they will be equal.
- B) Its holding period return.
- C) Its continuously compounded return.

### Question #53 of 193

Question ID: 413199

A grant writer for a local school district is trying to justify an application for funding an after-school program for low-income families. Census information for the school district shows an average household income of \$26,200 with a standard deviation of \$8,960. Assuming that the household income is normally distributed, what is the percentage of households in the school district with incomes of less than \$12,000?

- A) 15.87%.
- B) 5.71%.
- C) 9.92%.

### Question #54 of 193

Question ID: 413311

Sunil Hameed is a reporter with the weekly periodical *The Fun Finance Times*. Today, he is scheduled to interview a researcher who claims to have developed a successful technical trading strategy based on trading on the CEO's birthday (sample was taken from the Fortune 500). After the interview, Hameed summarizes his notes (partial transcript as follows). The researcher:

- was defensive about the lack of economic theory consistent with his results.
- used the same database of data for all his tests and has not tested the trading rule on out-of-sample data.
- excluded stocks for which he could not determine the CEO's birthday.
- used a sample cut-off date of the month before the latest market correction.

Select the choice that *best* completes the following: Hameed concludes that the research is flawed because the data and process are biased by:

- A) data mining, time-period bias, and look-ahead bias.
  - B) data mining, sample selection bias, and time-period bias.
  - C) sample selection bias and time-period bias.
- 

### Question #55 of 193

Question ID: 434209

A stated interest rate of 9% compounded continuously results in an effective annual rate *closest to*:

- A) 9.67%.
  - B) 9.42%.
  - C) 9.20%.
- 

### Question #56 of 193

Question ID: 413139

Which of the following statements about probability distributions is *least* accurate?

- A) The skewness of a normal distribution is zero.
  - B) A discrete random variable is a variable that can assume only certain clearly separated values resulting from a count of some set of items.
  - C) A binomial probability distribution is an example of a continuous probability distribution.
- 

### Question #57 of 193

Question ID: 413263

Melissa Cyprus, CFA, is conducting an analysis of inventory management practices in the retail industry. She assumes the population cross-sectional standard deviation of inventory turnover ratios is 20. How large a random sample should she gather in order to ensure a standard error of the sample mean of 4?

- A) 25.
  - B) 20.
  - C) 80.
- 

### Question #58 of 193

Question ID: 434207



Claude Bellow, CFA, is an analyst with a real-estate focused investment firm. Today, one of the partners e-mails Bellow the following table and requests that he look into the reward-to-variability ratios of two asset classes. The table below gives five years of annual returns for Marley REIT (real estate investment trust) and a large urban apartment building. Marley REIT invests in commercial properties. The risk-free rate is 5.0% and the firm's threshold rate for this type of investment is 5.7%. (*Note: For this question, calculate the mean returns using the arithmetic mean.*)

Table 1: Annual returns (in %)					
Asset	Year 1	Year 2	Year 3	Year 4	Year 5
Marley REIT	15.0	8.0	13.0	9.0	13.0
Apartment Bldg	10.0	-1.0	8.0	8.0	9.0

One of the office assistants begins to "run some numbers," but is then called away to an important meeting. So far, the assistant has calculated the standard deviation of the apartment building returns at 3.97% and the standard deviation of the REIT returns at 2.65%. (He assumed that the returns given represent the entire population of returns.) Now, Bellow must finish the work.

Bellow should conclude that the:

- A) REIT has a higher excess return per unit of risk than the apartment building has per unit of risk.
- B) partner is asking Bellow to select the investment with the minimal probability that the return falls below 5.70%.
- C) safety-first ratio for the REIT is 2.49.

## Question #59 of 193

Question ID: 413195

The average amount of snow that falls during January in Frostbite Falls is normally distributed with a mean of 35 inches and a standard deviation of 5 inches. The probability that the snowfall amount in January of next year will be between 40 inches and 26.75 inches is closest to:

- A) 87%.
- B) 79%.
- C) 68%.

## Question #60 of 193

Question ID: 413191

For a normal distribution, what *approximate* percentage of the observations fall within  $\pm 3$  standard deviation of the mean?

- A) 66%.
  - B) 95%.
  - C) 99%.
- 

### Question #61 of 193

Question ID: 413181

A multivariate normal distribution that includes three random variables can be completely described by the means and variances of each of the random variables and the:

- A) conditional probabilities among the three random variables.
  - B) correlation coefficient of the three random variables.
  - C) correlations between each pair of random variables.
- 

### Question #62 of 193

Question ID: 413168

Tracking error for a portfolio is *best* described as the:

- A) standard deviation of differences between an index return and portfolio return.
  - B) portfolio return minus a benchmark return.
  - C) sample mean minus population mean.
- 

### Question #63 of 193

Question ID: 413268

A traffic engineer is trying to measure the effects of carpool-only lanes on the expressway. Based on a sample of 100 cars at rush hour, he finds that the mean number of occupants per car is 2.5, and the sample standard deviation is 0.4. What is the standard error of the sample mean?

- A) 1.00.
  - B) 0.04.
  - C) 5.68.
- 

### Question #64 of 193

Question ID: 413267

If the number of offspring for females of a certain mammalian species has a mean of 16.4 and a standard deviation of 3.2, what will be the standard error of the sample mean for a survey of 25 females of the species?

- A) 1.28.
  - B) 3.20.
  - C) 0.64.
- 

### Question #65 of 193

Question ID: 413156

For a certain class of junk bonds, the probability of default in a given year is 0.2. Whether one bond defaults is independent of whether another bond defaults. For a portfolio of five of these junk bonds, what is the probability that zero or one bond of the five defaults in the year ahead?

- A) 0.4096.
  - B) 0.7373.
  - C) 0.0819.
- 

### Question #66 of 193

Question ID: 413231

Monte Carlo simulation is necessary to:

- A) compute continuously compounded returns.
  - B) reduce sampling error.
  - C) approximate solutions to complex problems.
- 

### Question #67 of 193

Question ID: 413135

The number of ships in the harbor is an example of what kind of variable?

- A) Continuous.
  - B) Discrete.
  - C) Indiscrete.
- 

### Question #68 of 193

Question ID: 484167

The sample mean return of Bartlett Co. is 3% and the standard deviation is 6% based on 30 monthly returns. What is the confidence interval of a two tailed z-test of the population mean with a 5% level of significance?

- A) 1.90 to 4.10.
  - B) 2.61 to 3.39.
  - C) 0.85 to 5.15.
- 

### Question #69 of 193

Question ID: 413216

If random variable  $Y$  follows a lognormal distribution then the natural log of  $Y$  must be:

- A) normally distributed.
  - B) lognormally distributed.
  - C) denoted as  $e^x$ .
- 

### Question #70 of 193

Question ID: 413282

Which one of the following statements about the t-distribution is *most* accurate?

- A) The t-distribution approaches the standard normal distribution as the number of degrees of freedom becomes large.
  - B) Compared to the normal distribution, the t-distribution has less probability in the tails.
  - C) The t-distribution is the only appropriate distribution to use when constructing confidence intervals based on large samples.
- 

### Question #71 of 193

Question ID: 413225

If a stock decreases from \$90 to \$80, the continuously compounded rate of return for the period is:

- A) -0.1250.
  - B) -0.1178.
  - C) -0.1000.
- 

### Question #72 of 193

Question ID: 434208

A stock that pays no dividend is currently priced at 42.00. One year ago the stock was 44.23. The continuously compounded rate of return is *closest to*:

- A) -5.17%.

B) +5.17%.

C) -5.04%.

---

### Question #73 of 193

Question ID: 413165

A stock priced at \$10 has a 60% probability of moving up and a 40% probability of moving down. If it moves up, it increases by a factor of 1.06. If it moves down, it decreases by a factor of  $1/1.06$ . What is the expected stock price after two successive periods?

A) \$11.24.

B) \$10.27.

C) \$10.03.

---

### Question #74 of 193

Question ID: 413133

An analyst has compiled stock returns for the first 10 days of the year for a sample of firms and estimated the correlation between these returns and changes in book value for these firms over the just ended year. What objection could be raised to such a correlation being used as a trading strategy?

A) The study suffers from look-ahead bias.

B) Use of year-end values causes a time-period bias.

C) Use of year-end values causes a sample selection bias.

---

### Question #75 of 193

Question ID: 413134

Which of the following is a discrete random variable?

A) The realized return on a corporate bond.

B) The amount of time between two successive stock trades.

C) The number of advancing stocks in the DJIA in a day.

---

### Question #76 of 193

Question ID: 413187

A portfolio manager is looking at an investment that has an expected annual return of 10% with a standard deviation of annual returns of 5%. Assuming the returns are approximately normally distributed, the probability that the return will exceed 20% in any given year is *closest* to:

A) 0.0%.

B) 2.28%.

C) 4.56%.

---

### Question #77 of 193

Question ID: 413309

Which of the following is the *best* method to avoid data mining bias when testing a profitable trading strategy?

- A) Test the strategy on a different data set than the one used to develop the rules.
  - B) Increase the sample size to at least 30 observations per year.
  - C) Use a sample free of survivorship bias.
- 

### Question #78 of 193

Question ID: 413221

Compared to a discretely compounded rate of return, continuous compounding will *most likely* result in a rate of return that is:

- A) lower.
  - B) the same.
  - C) higher.
- 

### Question #79 of 193

Question ID: 413276

Which of the following statements about sampling and estimation is *most* accurate?

- A) The standard error of the sample means when the standard deviation of the population is known equals  $\sigma / \sqrt{n}$ , where  $\sigma$  = sample standard deviation adjusted by  $n - 1$ .
  - B) The standard error of the sample means when the standard deviation of the population is unknown equals  $s / \sqrt{n}$ , where  $s$  = sample standard deviation.
  - C) The probability that a parameter lies within a range of estimated values is given by  $\alpha$ .
- 

### Question #80 of 193

Question ID: 413223

The continuously compounded rate of return that will generate a one-year holding period return of -6.5% is *closest* to:

- A) -5.7%.
  - B) -6.7%.
  - C) -6.3%.
- 

### Question #81 of 193

Question ID: 710143

A stock price decreases in one period and then increases by an equal amount in the next period. The investor calculates a holding period return for each period and calculates their arithmetic mean. The investor also calculates the continuously compounded rate of return for each period and calculates the arithmetic mean of these. Which of the arithmetic means will be greater?

- A) The mean of the holding period returns.
  - B) The mean of the continuously compounded returns.
  - C) Neither, because both will equal zero.
- 

### Question #82 of 193

Question ID: 413182

In a multivariate normal distribution, a correlation tells the:

- A) overall relationship between all the variables.
  - B) strength of the linear relationship between two of the variables.
  - C) relationship between the means and variances of the variables.
- 

### Question #83 of 193

Question ID: 413205

The annual rainfall amount in Yucutat, Alaska, is normally distributed with a mean of 150 inches and a standard deviation of 20 inches. The 90% confidence interval for the annual rainfall in Yucutat is *closest* to:

- A) 137 to 163 inches.
  - B) 110 to 190 inches.
  - C) 117 to 183 inches.
- 

### Question #84 of 193

Question ID: 413152

A cumulative distribution function for a random variable  $X$  is given as follows:

$x$	$F(x)$
5	0.14
10	0.25
15	0.86
20	1.00

The probability of an outcome less than or equal to 10 is:

- A) 14%.
- B) 25%.
- C) 39%.

### Question #85 of 193

Question ID: 413236

From the entire population of McDonald's franchises, an analyst constructs a sample of the monthly sales volume for 20 randomly selected franchises. She calculates the mean sales volume for those 20 franchises to be \$400,000. The sampling distribution of the mean is the probability distribution of the:

- A) mean monthly sales volume estimates from all possible samples of 20 observations.
- B) mean monthly sales volume estimates from all possible samples.
- C) monthly sales volume for all McDonald's franchises.

### Question #86 of 193

Question ID: 413170

A random variable follows a continuous uniform distribution over 27 to 89. What is the probability of an outcome between 34 and 38?

- A) 0.0546.
- B) 0.0645.
- C) 0.0719.

### Question #87 of 193

Question ID: 413162

The Night Raiders, an expansion team in the National Indoor Football League, is having a challenging first season with a current win loss record of 0 and 4. However, the team recently signed four new defensive players and one of the team sponsors (who also happens to hold a CFA charter) calculates the probability of the team winning a game at 0.40. Assuming that whether the team wins a game is independent of whether it wins any other game, the probability that the team will win 6 out of the next 10 games is *closest* to:



- A) 0.350.
  - B) 0.112.
  - C) 0.417.
- 

### Question #88 of 193

Question ID: 413155

Possible outcomes for a discrete uniform distribution are the integers 2 to 9 inclusive. What is the probability of an outcome less than 5?

- A) 62.5%.
  - B) 50.0%.
  - C) 37.5%.
- 

### Question #89 of 193

Question ID: 413269

From a population of 5,000 observations, a sample of  $n = 100$  is selected. Calculate the standard error of the sample mean if the population standard deviation is 50.

- A) 50.00.
  - B) 5.00.
  - C) 4.48.
- 

### Question #90 of 193

Question ID: 413153

The number of days a particular stock increases in a given five-day period is uniformly distributed between zero and five inclusive. In a given five-day trading week, what is the probability that the stock will increase exactly three days?

- A) 0.167.
  - B) 0.600.
  - C) 0.333.
- 

### Question #91 of 193

Question ID: 529150

**Standard Normal Distribution**

$P(Z \leq z) = N(z)$  for  $z \geq 0$

z	0.0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389

John Cupp, CFA, has several hundred clients. The values of the portfolios Cupp manages are approximately normally distributed with a mean of \$800,000 and a standard deviation of \$250,000. The probability of a randomly selected portfolio being in excess of \$1,000,000 is:

- A) 0.2119.
- B) 0.3773.
- C) 0.1057.

## Question #92 of 193

Question ID: 434218

### Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
30	1.310	1.697	2.042	2.457	2.750	3.646
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373

From a sample of 41 orders for an on-line bookseller, the average order size is \$75, and the sample standard deviation is \$18. Assume the distribution of orders is normal. For which interval can one be exactly 90% confident that the population mean is contained in that interval?

- A) \$74.24 to \$75.76.
- B) \$70.27 to \$79.73.
- C) \$71.29 to 78.71.

## Question #93 of 193

Question ID: 413151

Which of the following qualifies as a cumulative distribution function?

- A)  $F(1) = 0$ ,  $F(2) = 0.25$ ,  $F(3) = 0.50$ ,  $F(4) = 1$ .
- B)  $F(1) = 0.5$ ,  $F(2) = 0.25$ ,  $F(3) = 0.25$ .

C)  $F(1) = 0$ ,  $F(2) = 0.5$ ,  $F(3) = 0.5$ ,  $F(4) = 0$ .

---

### Question #94 of 193

Question ID: 413149

The cumulative distribution function for a random variable  $X$  is given in the following table:

$x$	$F(x)$
5	0.15
10	0.30
15	0.45
20	0.75
25	1.00

The probability of an outcome greater than 15 is:

- A) 75%.
- B) 55%.
- C) 45%.

---

### Question #95 of 193

Question ID: 413194

A group of investors wants to be sure to always earn at least a 5% rate of return on their investments. They are looking at an investment that has a normally distributed probability distribution with an expected rate of return of 10% and a standard deviation of 5%. The probability of meeting or exceeding the investors' desired return in any given year is *closest to*:

- A) 98%.
- B) 84%.
- C) 34%.

---

### Question #96 of 193

Question ID: 452011

#### Standard Normal Distribution

$P(Z \leq z) = N(z)$  for  $z \geq 0$

$z$	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549

0.7 0.7580 0.7611 0.7642 0.7673 0.7704 0.7734 0.7764 0.7794 0.7823 0.7852  
0.8 0.7881 0.7910 0.7939 0.7967 0.7995 0.8023 0.8051 0.8078 0.8106 0.8133  
0.9 0.8159 0.8186 0.8212 0.8238 0.8264 0.8289 0.8315 0.8340 0.8365 0.8389  
1.0 0.8413 0.8438 0.8461 0.8485 0.8508 0.8531 0.8554 0.8577 0.8599 0.8621  
1.1 0.8643 0.8665 0.8686 0.8708 0.8729 0.8749 0.8770 0.8790 0.8810 0.8830  
1.2 0.8849 0.8869 0.8888 0.8907 0.8925 0.8944 0.8962 0.8980 0.8997 0.9015  
1.3 0.9032 0.9049 0.9066 0.9082 0.9099 0.9115 0.9131 0.9147 0.9162 0.9177  
1.4 0.9192 0.9207 0.9222 0.9236 0.9251 0.9265 0.9279 0.9292 0.9306 0.9319

Given a normally distributed population with a mean income of \$40,000 and standard deviation of \$7,500, what percentage of the population makes between \$30,000 and \$35,000?

- A) 15.96.
  - B) 41.67.
  - C) 13.34.
- 

### Question #97 of 193

Question ID: 413256

Suppose the mean debt/equity ratio of the population of all banks in the United States is 20 and the population variance is 25. A banking industry analyst uses a computer program to select a random sample of 50 banks from this population and compute the sample mean. The program repeats this exercise 1000 times and computes the sample mean each time. According to the central limit theorem, the sampling distribution of the 1000 sample means will be approximately normal if the population of bank debt/equity ratios has:

- A) a normal distribution, because the sample is random.
  - B) a Student's *t*-distribution, because the sample size is greater than 30.
  - C) any probability distribution.
- 

### Question #98 of 193

Question ID: 710145

Which of the following statements regarding confidence intervals is *most* accurate?

- A) The lower the significance level, the wider the confidence interval.
  - B) The lower the degree of confidence, the wider the confidence interval.
  - C) The higher the significance level, the wider the confidence interval.
- 

### Question #99 of 193

Question ID: 413161

There is an 80% chance of rain on each of the next six days. What is the probability that it will rain on exactly two of those days?

- A) 0.24327.
  - B) 0.01536.
  - C) 0.15364.
- 

### Question #100 of 193

Question ID: 413243

Sampling error can be defined as:

- A) the standard deviation of a sampling distribution of the sample means.
  - B) rejecting the null hypothesis when it is true.
  - C) the difference between a sample statistic and its corresponding population parameter.
- 

### Question #101 of 193

Question ID: 413169

If  $X$  follows a continuous uniform distribution over the interval  $1 < X < 26$ , the probability that  $X$  is between 5 and 15 is *closest* to:

- A) 40%.
  - B) 60%.
  - C) 10%.
- 

### Question #102 of 193

Question ID: 413154

Which of the following random variables would be *most likely* to follow a discrete uniform distribution?

- A) The number of heads on the flip of two coins.
  - B) The outcome of a roll of a standard, six-sided die where  $X$  equals the number facing up on the die.
  - C) The outcome of the roll of two standard, six-sided dice where  $X$  is the sum of the numbers facing up.
- 

### Question #103 of 193

Question ID: 413175

In a normal distribution, the:

- A) mean is greater than the median.
- B) median equals the mode.
- C) mean is less than the mode.

---

**Question #104 of 193**

Question ID: 413217

If a random variable  $x$  is lognormally distributed then  $\ln x$  is:

- A) normally distributed.
  - B) abnormally distributed.
  - C) defined as  $e^x$ .
- 

**Question #105 of 193**

Question ID: 413174

A normal distribution can be completely described by its:

- A) mean and mode.
  - B) mean and variance.
  - C) skewness and kurtosis.
- 

**Question #106 of 193**

Question ID: 413178

If  $X$  has a normal distribution with  $\mu = 100$  and  $\sigma = 5$ , then there is approximately a 90% probability that:

- A)  $P(90.2 < X < 109.8)$ .
  - B)  $P(91.8 < X < 108.3)$ .
  - C)  $P(93.4 < X < 106.7)$ .
- 

**Question #107 of 193**

Question ID: 413215

Given  $Y$  is lognormally distributed, then  $\ln Y$  is:

- A) a lognormal distribution.
  - B) normally distributed.
  - C) the antilog of  $Y$ .
- 

**Question #108 of 193**

Question ID: 413306

The confidence interval for a parameter is calculated as:

- A) Point Estimate  $\times$  Reliability Factor  $\pm$  Standard Error.
  - B) Point Estimate  $\pm$  Standard Error.
  - C) Point Estimate  $\pm$  Reliability Factor  $\times$  Standard Error.
- 

### Question #109 of 193

Question ID: 498734

Which of the following random variables assigns an equal probability to each possible outcome?

- A) Binomial random variable.
  - B) Discrete uniform random variable.
  - C) Bernoulli random variable.
- 

### Question #110 of 193

Question ID: 550538

The average return on small stocks over the period 1926-1997 was 17.7%, and the standard deviation of the sample was 33.9%. Assuming returns are normally distributed, the 95% confidence interval for the return on small stocks in any given year is:

- A) 16.8% to 18.6%.
  - B) -48.7% to 84.1%.
  - C) -16.2% to 51.6%.
- 

### Question #111 of 193

Question ID: 413230

Which of the following statements describes a limitation of Monte Carlo simulation?

- A) Variables are assumed to be normally distributed but may actually have non-normal distributions.
  - B) Simulations do not consider possible input values that lie outside historical experience.
  - C) Outcomes of a simulation can only be as accurate as the inputs to the model.
- 

### Question #112 of 193

Question ID: 413237

A simple random sample is a sample constructed so that:

- A) each element of the population has the same probability of being selected as part of the sample.
  - B) each element of the population is also an element of the sample.
  - C) the sample size is random.
- 

### Question #113 of 193

Question ID: 413258

Frank Grinder is trying to introduce sampling into the quality control program of an old-line manufacturer. Currently, each item is individually inspected to make sure it meets size tolerances. For all items manufactured during August, the standard deviation of size was 0.02 centimeters. If Grinder takes a sample of 30 items and finds a standard deviation of size of 0.019 centimeters, what is the standard error of the sample mean?

- A) 0.00600.
  - B) 0.00200.
  - C) 0.00365.
- 

### Question #114 of 193

Question ID: 413286

A sample of 25 junior financial analysts gives a mean salary (in thousands) of 60. Assume the population variance is known to be 100. A 90% confidence interval for the mean starting salary of junior financial analysts is *most* accurately constructed as:

- A)  $60 \pm 1.645(4)$ .
  - B)  $60 \pm 1.645(10)$ .
  - C)  $60 \pm 1.645(2)$ .
- 

### Question #115 of 193

Question ID: 413298

A sample of 100 individual investors has a mean portfolio value of \$28,000 with a standard deviation of \$4,250. The 95% confidence interval for the population mean is *closest* to:

- A) \$27,575 to \$28,425.
  - B) \$19,500 to \$28,333.
  - C) \$27,159 to \$28,842.
- 

### Question #116 of 193

Question ID: 413254

The central limit theorem states that, for any distribution, as  $n$  gets larger, the sampling distribution:



- A) approaches a normal distribution.
- B) approaches the mean.
- C) becomes larger.

### Question #117 of 193

Question ID: 413247

Thomas Merton, a car industry analyst, wants to investigate a relationship between the types of ads used in advertising campaigns and sales to customers in certain age groups. In order to make sure he includes manufacturers of all sizes, Merton divides the industry into four size groups and draws random samples from each group. What sampling method is Merton using?

- A) Simple random sampling.
- B) Cross-sectional sampling.
- C) Stratified random sampling.

### Question #118 of 193

Question ID: 434217

#### Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373

From a sample of 41 monthly observations of the S&P Mid-Cap index, the mean monthly return is 1% and the sample variance is 36. For which of the following intervals can one be *closest* to 95% confident that the population mean is contained in that interval?

- A)  $1.0\% \pm 1.6\%$ .
- B)  $1.0\% \pm 1.9\%$ .
- C)  $1.0\% \pm 6.0\%$ .

### Question #119 of 193

Question ID: 627885

#### Cumulative z-table:

z	0.00	0.01	0.02	0.03
---	------	------	------	------

<b>1.6</b>	0.9452	0.9463	0.9474	0.9484
<b>1.7</b>	0.9564	0.9564	0.9573	0.9582
<b>1.8</b>	0.9641	0.9649	0.9656	0.9664

Monthly sales of hot water heaters are approximately normally distributed with a mean of 21 and a standard deviation of 5. What is the probability of selling 12 hot water heaters or less next month?

- A)** 96.41%.
  - B)** 1.80%.
  - C)** 3.59%.
- 

### Question #120 of 193

Question ID: 413189

An investment has a mean return of 15% and a standard deviation of returns equal to 10%. If returns are normally distributed, which of the following statements is *least* accurate? The probability of obtaining a return:

- A)** greater than 35% is 0.025.
  - B)** between 5% and 25% is 0.68.
  - C)** greater than 25% is 0.32.
- 

### Question #121 of 193

Question ID: 413136

A dealer in a casino has rolled a five on a single die three times in a row. What is the probability of her rolling another five on the next roll, assuming it is a fair die?

- A)** 0.200.
  - B)** 0.167.
  - C)** 0.001.
- 

### Question #122 of 193

Question ID: 413249

The sample of per square foot sales for 100 U.S. retailers in December 2004 is an example of:

- A)** unbiased data.
  - B)** cross-sectional data.
  - C)** time-series data.
-

### Question #123 of 193

Question ID: 413192

A stock portfolio's returns are normally distributed. It has had a mean annual return of 25% with a standard deviation of 40%. The probability of a return between -41% and 91% is *closest to*:

- A) 95%.
  - B) 65%.
  - C) 90%.
- 

### Question #124 of 193

Question ID: 413183

A multivariate distribution is *best* defined as describing the behavior of:

- A) a random variable with more than two possible outcomes.
  - B) two or more independent random variables.
  - C) two or more dependent random variables.
- 

### Question #125 of 193

Question ID: 434215

#### Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
18	1.330	1.734	2.101	2.552	2.878	3.922
19	1.328	1.729	2.093	2.539	2.861	3.883
20	1.325	1.725	2.086	2.528	2.845	3.850

A traffic engineer is trying to measure the effects of carpool-only lanes on the expressway. Based on a sample of 20 cars at rush hour, he finds that the mean number of occupants per car is 2.5, with a standard deviation of 0.4. If the population is normally distributed, what is the confidence interval at the 5% significance level for the number of occupants per car?

- A) 2.387 to 2.613.
  - B) 2.313 to 2.687.
  - C) 2.410 to 2.589.
- 

### Question #126 of 193

Question ID: 413180

Multivariate distributions can describe:

- A) continuous random variables only.
  - B) discrete random variables only.
  - C) either discrete or continuous random variables.
- 

### Question #127 of 193

Question ID: 413206

A food retailer has determined that the mean household income of her customers is \$47,500 with a standard deviation of \$12,500. She is trying to justify carrying a line of luxury food items that would appeal to households with incomes greater than \$60,000. Based on her information and assuming that household incomes are normally distributed, what percentage of households in her customer base has incomes of \$60,000 or more?

- A) 5.00%.
  - B) 2.50%.
  - C) 15.87%.
- 

### Question #128 of 193

Question ID: 442251

#### Cumulative Z-Table

z	0.04	0.05
1.8	0.9671	0.9678
1.9	0.9738	0.9744
2.0	0.9793	0.9798
2.1	0.9838	0.9842

The owner of a bowling alley determined that the average weight for a bowling ball is 12 pounds with a standard deviation of 1.5 pounds. A ball denoted "heavy" should be one of the top 2% based on weight. Assuming the weights of bowling balls are normally distributed, at what weight (in pounds) should the "heavy" designation be used?

- A) 14.22 pounds.
  - B) 14.00 pounds.
  - C) 15.08 pounds.
- 

### Question #129 of 193

Question ID: 413264

A sample of size  $n = 25$  is selected from a normal population. This sample has a mean of 15 and a sample variance of 4. What is the standard error of the sample mean?

- A) 0.8.
  - B) 0.4.
  - C) 2.0.
- 

### Question #130 of 193

Question ID: 413141

Which of the following statements about the normal probability distribution is *most* accurate?

- A) Five percent of the normal curve probability is more than two standard deviations from the mean.
  - B) The normal curve is asymmetrical about its mean.
  - C) Sixty-eight percent of the area under the normal curve falls between the mean and 1 standard deviation above the mean.
- 

### Question #131 of 193

Question ID: 413273

The range of possible values in which an actual population parameter may be observed at a given level of probability is known as a:

- A) significance level.
  - B) confidence interval.
  - C) degree of confidence.
- 

### Question #132 of 193

Question ID: 413222

Mei Tekei just celebrated her 22nd birthday. When she is 27, she will receive a \$100,000 inheritance. Tekei needs funds for the down payment on a co-op in Manhattan and has found a bank that will give her the present value of her inheritance amount, assuming an 8.0% stated annual interest rate with continuous compounding. Will the proceeds from the bank be sufficient to cover her down payment of \$65,000?

- A) No, Tekei will only receive \$61,878.
  - B) Yes, Tekei will receive \$68,058.
  - C) Yes, Tekei will receive \$67,028.
-

### Question #133 of 193

Question ID: 413255

Which of the following is NOT a prediction of the central limit theorem?

- A) The mean of the sampling distribution of the sample means will be equal to the population mean.
  - B) The standard error of the sample mean will increase as the sample size increases.
  - C) The variance of the sampling distribution of sample means will approach the population variance divided by the sample size.
- 

### Question #134 of 193

Question ID: 710144

Which of the following statements about a confidence interval for a population mean is *most* accurate?

- A) For a sample size of 30, using a *t*-statistic will result in a wider confidence interval for a population mean than using a *z*-statistic.
  - B) If the population variance is unknown, a large sample size is required in order to estimate a confidence interval for the population mean.
  - C) When a *z*-statistic is acceptable, a 95% confidence interval for a population mean is the sample mean plus-or-minus 1.96 times the sample standard deviation.
- 

### Question #135 of 193

Question ID: 413289

Construct a 90% confidence interval for the mean starting salaries of the CFA charterholders if a sample of 100 recent CFA charterholders gives a mean of 50. Assume that the population variance is 900. All measurements are in \$1,000.

- A)  $50 \pm 1.645(30)$ .
  - B)  $50 \pm 1.645(900)$ .
  - C)  $50 \pm 1.645(3)$ .
- 

### Question #136 of 193

Question ID: 413283

Which statement *best* describes the properties of Student's *t*-distribution? The *t*-distribution is:

- A) symmetrical, and defined by a single parameter.
  - B) skewed, and defined by a single parameter.
  - C) symmetrical, and defined by two parameters.
-

**Question #137 of 193**

Question ID: 413265

The following data are available on a sample of advertising budgets of 81 U.S. manufacturing companies: The mean budget is \$10 million. The sample variance is 36 million. The standard error of the sample mean is:

- A) \$1,111.
  - B) \$400.
  - C) \$667.
- 

**Question #138 of 193**

Question ID: 413173

A discount brokerage firm states that the time between a customer order for a trade and the execution of the order is uniformly distributed between three minutes and fifteen minutes. If a customer orders a trade at 11:54 A.M., what is the probability that the order is executed after noon?

- A) 0.500.
  - B) 0.750.
  - C) 0.250.
- 

**Question #139 of 193**

Question ID: 413177

Which of the following statements about a normal distribution is *least* accurate?

- A) Approximately 34% of the observations fall within plus or minus one standard deviation of the mean.
  - B) The distribution is completely described by its mean and variance.
  - C) Kurtosis is equal to 3.
- 

**Question #140 of 193**

Question ID: 413240

Sampling error is the:

- A) difference between the point estimate of the mean and the mean of the sampling distribution.
  - B) estimation error created by using a non-random sample.
  - C) difference between a sample statistic and its corresponding population parameter.
-

### Question #141 of 193

Question ID: 413138

Which of the following statements about probability distributions is *least* accurate?

- A) A probability distribution includes a listing of all the possible outcomes of an experiment.
  - B) A probability distribution is, by definition, normally distributed.
  - C) In a binomial distribution each observation has only two possible outcomes that are mutually exclusive.
- 

### Question #142 of 193

Question ID: 413193

A stock portfolio has had a historical average annual return of 12% and a standard deviation of 20%. The returns are normally distributed. The range -27.2 to 51.2% describes a:

- A) 99% confidence interval.
  - B) 68% confidence interval.
  - C) 95% confidence interval.
- 

### Question #143 of 193

Question ID: 413280

Which one of the following distributions is described entirely by the degrees of freedom?

- A) Normal distribution.
  - B) Student's t-distribution.
  - C) Lognormal distribution.
- 

### Question #144 of 193

Question ID: 413305

In which one of the following cases is the t-statistic the appropriate one to use in the construction of a confidence interval for the population mean?

- A) The distribution is normal, the population variance is known, and the sample size is less than 30.
  - B) The distribution is nonnormal, the population variance is unknown, and the sample size is at least 30.
  - C) The distribution is nonnormal, the population variance is known, and the sample size is at least 30.
-



**Question #145 of 193**

Question ID: 413211

Which of the following portfolios provides the optimal "safety first" return if the minimum acceptable return is 9%?

<i>Portfolio</i>	<i>Expected Return (%)</i>	<i>Standard Deviation (%)</i>
1	13	5
2	11	3
3	9	2

- A) 1.
  - B) 2.
  - C) 3.
- 

**Question #146 of 193**

Question ID: 413262

From a population with a known standard deviation of 15, a sample of 25 observations is taken. Calculate the standard error of the sample mean.

- A) 1.67.
  - B) 0.60.
  - C) 3.00.
- 

**Question #147 of 193**

Question ID: 413250

Monthly Gross Domestic Product (GDP) figures from 1990-2000 are an example of:

- A) cross-sectional data.
  - B) time-series data.
  - C) systematic data.
- 

**Question #148 of 193**

Question ID: 413200

Standardizing a normally distributed random variable requires the:

- A) mean, variance and skewness.
  - B) mean and the standard deviation.
  - C) natural logarithm of X.
- 

### Question #149 of 193

Question ID: 413143

Which of the following is *least likely* to be an example of a discrete random variable?

- A) The rate of return on a real estate investment.
  - B) The number of days of sunshine in the month of May 2006 in a particular city.
  - C) Quoted stock prices on the NASDAQ.
- 

### Question #150 of 193

Question ID: 413188

A client will move his investment account unless the portfolio manager earns at least a 10% rate of return on his account. The rate of return for the portfolio that the portfolio manager has chosen has a normal probability distribution with an expected return of 19% and a standard deviation of 4.5%. What is the probability that the portfolio manager will keep this account?

- A) 0.977.
  - B) 0.750.
  - C) 0.950.
- 

### Question #151 of 193

Question ID: 413307

Which of the following would result in a wider confidence interval? A:

- A) greater level of significance.
  - B) higher alpha level.
  - C) higher degree of confidence.
- 

### Question #152 of 193

Question ID: 413239

The sampling distribution of a statistic is:

- A) the same as the probability distribution of the underlying population.
- B) always a standard normal distribution.

- C) the probability distribution consisting of all possible sample statistics computed from samples of the same size drawn from the same population.
- 

### Question #153 of 193

Question ID: 413244

Which of the following is *least likely* a step in stratified random sampling?

- A) The population is divided into strata based on some classification scheme.
  - B) The sub-samples are pooled to create the complete sample.
  - C) The size of each sub-sample is selected to be the same across strata.
- 

### Question #154 of 193

Question ID: 498735

Bill Phillips is developing a Monte Carlo simulation to value a complex and thinly traded security. Phillips wants to model one input variable to have negative skewness and a second input variable to have positive excess kurtosis. In a Monte Carlo simulation, Phillips can appropriately use:

- A) only one of these variables.
  - B) both of these variables.
  - C) neither of these variables.
- 

### Question #155 of 193

Question ID: 413279

With 60 observations, what is the appropriate number of degrees of freedom to use when carrying out a statistical test on the mean of a population?

- A) 59.
  - B) 61.
  - C) 60.
- 

### Question #156 of 193

Question ID: 413233

Many analysts prefer to use Monte Carlo simulation rather than historical simulation because:

- A) computers can manipulate theoretical data much more quickly than historical data.
- B) it is much easier to generate the required variables.

C) past distributions cannot address changes in correlations or events that have not happened before.

---

### Question #157 of 193

Question ID: 413209

If the threshold return is higher than the risk-free rate, what will be the relationship between Roy's safety-first ratio (SF) and Sharpe's ratio?

- A) The SF ratio will be lower.
  - B) The SF ratio will be higher.
  - C) The SF ratio may be higher or lower depending on the standard deviation.
- 

### Question #158 of 193

Question ID: 529151

An equity analyst needs to select a representative sample of manufacturing stocks. Starting with the population of all publicly traded manufacturing stocks, she classifies each stock into one of the 20 industry groups that form the Index of Industrial Production for the manufacturing industry. She then selects four stocks from each industry. The sampling method the analyst is using is *best* characterized as:

- A) stratified random sampling.
  - B) random sampling.
  - C) nonrandom sampling.
- 

### Question #159 of 193

Question ID: 434213

A nursery sells trees of different types and heights. Suppose that 75 trees chosen at random are sold for planting at City Hall. These 75 trees average 60 inches in height with a standard deviation of 16 inches.

Using this information, construct a 95% confidence interval for the mean height of all trees in the nursery.

- A)  $0.8 \pm 1.96(16)$ .
  - B)  $60 \pm 1.96(1.85)$ .
  - C)  $60 \pm 1.96(16)$ .
- 

### Question #160 of 193

Question ID: 413184

In addition to the usual parameters that describe a normal distribution, to completely describe 10 random variables, a multivariate normal distribution requires knowing the:

- A) 10 correlations.
  - B) overall correlation.
  - C) 45 correlations.
- 

### Question #161 of 193

Question ID: 413172

The probability density function of a continuous uniform distribution is *best* described by a:

- A) line segment with a curvilinear slope.
  - B) line segment with a 45-degree slope.
  - C) horizontal line segment.
- 

### Question #162 of 193

Question ID: 413319

Studies of performance of a sample of mutual fund managers *most likely* suffer from:

- A) survivorship bias.
  - B) look-ahead bias.
  - C) sample-selection bias.
- 

### Question #163 of 193

Question ID: 413235

A drawback of historical simulation is it:

- A) may not accurately reflect possible outcomes.
  - B) depends on the accuracy of the random number generator.
  - C) may not account for very rare events.
- 

### Question #164 of 193

Question ID: 413232

The difference between a Monte Carlo simulation and a historical simulation is that a historical simulation uses randomly selected variables from past distributions, while a Monte Carlo simulation:

- A) uses randomly selected variables from future distributions.
  - B) projects variables based on *a priori* principles.
  - C) uses a computer to generate random variables.
- 

### Question #165 of 193

Question ID: 413150

A random variable  $X$  is continuous and bounded between zero and five,  $X:(0 \leq X \leq 5)$ . The cumulative distribution function (cdf) for  $X$  is  $F(x) = x / 5$ . Calculate  $P(2 \leq X \leq 4)$ .

- A) 0.50.
  - B) 1.00.
  - C) 0.40.
- 

### Question #166 of 193

Question ID: 413272

The sample mean is an unbiased estimator of the population mean because the:

- A) expected value of the sample mean is equal to the population mean.
  - B) sampling distribution of the sample mean has the smallest variance of any other unbiased estimators of the population mean.
  - C) sample mean provides a more accurate estimate of the population mean as the sample size increases.
- 

### Question #167 of 193

Question ID: 413321

When sampling from a nonnormal distribution with an known variance, which statistic should be used if the sample size is *large* and if the respective sample size is *small*?

- A) *t*-statistic; *t*-statistic.
  - B) *z*-statistic; *z*-statistic.
  - C) *z*-statistic; not available.
- 

### Question #168 of 193

Question ID: 413163

A stock priced at \$100 has a 70% probability of moving up and a 30% probability of moving down. If it moves up, it increases by

a factor of 1.02. If it moves down, it decreases by a factor of  $1/1.02$ . What is the probability that the stock will be \$100 after two successive periods?

- A) 42%.
  - B) 21%.
  - C) 9%.
- 

### Question #169 of 193

Question ID: 413176

A normal distribution is completely described by its:

- A) mean, mode, and skewness.
  - B) median and mode.
  - C) variance and mean.
- 

### Question #170 of 193

Question ID: 413310

An analyst has reviewed market data for returns from 1980-1990 extensively, searching for patterns in the returns. She has found that when the end of the month falls on a Saturday, there are usually positive returns on the following Thursday. She has engaged in:

- A) data mining.
  - B) data snooping.
  - C) biased selection.
- 

### Question #171 of 193

Question ID: 413274

Which of the following characterizes the typical construction of a confidence interval *most* accurately?

- A) Point estimate  $\pm$  (Standard error / Reliability factor).
  - B) Point estimate  $\pm$  (Reliability factor  $\times$  Standard error).
  - C) Standard error  $\pm$  (Point estimate / Reliability factor).
- 

### Question #172 of 193

Question ID: 413246

An analyst divides the population of U.S. stocks into 10 equally sized sub-samples based on market value of equity. Then he takes a random sample of 50 from each of the 10 sub-samples and pools the data to create a sample of 500. This is an example

of:

- A) stratified random sampling.
  - B) simple random sampling.
  - C) systematic cross-sectional sampling.
- 

### Question #173 of 193

Question ID: 413318

A scientist working for a pharmaceutical company tries many models using the same data before reporting the one that shows that the given drug has no serious side effects. The scientist is guilty of:

- A) look-ahead bias.
  - B) sample selection bias.
  - C) data mining.
- 

### Question #174 of 193

Question ID: 413157

Which of the following is NOT an assumption of the binomial distribution?

- A) The trials are independent.
  - B) The expected value is a whole number.
  - C) Random variable X is discrete.
- 

### Question #175 of 193

Question ID: 452012

The central limit theorem concerns the sampling distribution of the:

- A) population mean.
  - B) sample mean.
  - C) sample standard deviation.
-



**Question #176 of 193**

Question ID: 413144

Assume a discrete distribution for the number of possible sunny days in Provo, Utah during the week of April 20 through April 26. For this discrete distribution,  $p(x) = 0$  when  $x$  cannot occur, or  $p(x) > 0$  if it can. Based on this information, what is the probability of it being sunny on 5 days and on 10 days during the week, respectively?

- A) A positive value; zero.
  - B) Zero; infinite.
  - C) A positive value; infinite.
- 

**Question #177 of 193**

Question ID: 413275

A range of estimated values within which the actual value of a population parameter will lie with a given probability of  $1 - \alpha$  is  $a(n)$ :

- A)  $\alpha$  percent point estimate.
  - B)  $\alpha$  percent confidence interval.
  - C)  $(1 - \alpha)$  percent confidence interval.
- 

**Question #178 of 193**

Question ID: 413201

Which of the following represents the mean, standard deviation, and variance of a standard normal distribution?

- A) 1, 1, 1.
  - B) 1, 2, 4.
  - C) 0, 1, 1.
- 

**Question #179 of 193**

Question ID: 413219

The farthest point on the left side of the lognormal distribution:

- A) can be any negative number.
  - B) is skewed to the left.
  - C) is bounded by 0.
-

### Question #180 of 193

Question ID: 413218

Which of the following statements regarding the distribution of returns used for asset pricing models is *most* accurate?

- A) Lognormal distribution returns are used for asset pricing models because they will not result in an asset return of less than -100%.
  - B) Normal distribution returns are used for asset pricing models because they will only allow the asset price to fall to zero.
  - C) Lognormal distribution returns are used because this will allow for negative returns on the assets.
- 

### Question #181 of 193

Question ID: 413271

The sample mean is a consistent estimator of the population mean because the:

- A) sample mean provides a more accurate estimate of the population mean as the sample size increases.
  - B) expected value of the sample mean is equal to the population mean.
  - C) sampling distribution of the sample mean has the smallest variance of any other unbiased estimators of the population mean.
- 

### Question #182 of 193

Question ID: 413320

Which of the following statements about sample statistics is *least* accurate?

- A) There is no sample statistic for non-normal distributions with unknown variance for either small or large samples.
  - B) The z-statistic is used for nonnormal distributions with known variance, but only for large samples.
  - C) The z-statistic is used to test normally distributed data with a known variance, whether testing a large or a small sample.
- 

### Question #183 of 193

Question ID: 413290

What is the 95% confidence interval for a population mean with a known population variance of 9, based on a sample of 400 observations with mean of 96?

- A) 95.118 to 96.882.
  - B) 95.613 to 96.387.
  - C) 95.706 to 96.294.
-

### Question #184 of 193

Question ID: 413148

A probability function:

- A) only applies to continuous distributions.
  - B) specifies the probability that the random variable takes on a specific value.
  - C) is often referred to as the "cdf."
- 

### Question #185 of 193

Question ID: 413266

A population has a mean of 20,000 and a standard deviation of 1,000. Samples of size  $n = 2,500$  are taken from this population. What is the standard error of the sample mean?

- A) 400.00.
  - B) 20.00.
  - C) 0.04.
- 

### Question #186 of 193

Question ID: 413213

Three portfolios with normally distributed returns are available to an investor who wants to minimize the probability that the portfolio return will be less than 5%. The risk and return characteristics of these portfolios are shown in the following table:

<u>Portfolio</u>	<u>Expected return</u>	<u>Standard deviation</u>
Epps	6%	4%
Flake	7%	9%
Grant	10%	15%

Based on Roy's safety-first criterion, which portfolio should the investor select?

- A) Epps.
  - B) Grant.
  - C) Flake.
- 

### Question #187 of 193

Question ID: 434216

Student's *t*-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
24	1.318	1.711	2.064	2.492	2.797	3.745
25	1.316	1.708	2.060	2.485	2.787	3.725
26	1.315	1.706	2.056	2.479	2.779	3.707
27	1.314	1.703	2.052	2.473	2.771	3.690

A random sample of 25 Indiana farms had a mean number of cattle per farm of 27 with a sample standard deviation of five. Assuming the population is normally distributed, what would be the 95% confidence interval for the number of cattle per farm?

- A) 23 to 31.
- B) 25 to 29.
- C) 22 to 32.

### Question #188 of 193

Question ID: 413159

A casual laborer has a 70% chance of finding work on each day that she reports to the day labor marketplace. What is the probability that she will work three days out of five?

- A) 0.6045.
- B) 0.3087.
- C) 0.3192.

### Question #189 of 193

Question ID: 413179

The lower limit of a normal distribution is:

- A) negative infinity.
- B) zero.
- C) negative one.

### Question #190 of 193

Question ID: 413270

A statistical estimator is unbiased if:

- A) an increase in sample size decreases the standard error.
- B) the variance of its sampling distribution is smaller than that of all other estimators.

C) the expected value of the estimator is equal to the population parameter.

---

### Question #191 of 193

Question ID: 413292

A sample size of 25 is selected from a normal population. This sample has a mean of 15 and the population variance is 4.

Using this information, construct a 95% confidence interval for the population mean,  $\mu$ .

- A)  $15 \pm 1.96(0.4)$ .
- B)  $15 \pm 1.96(2)$ .
- C)  $15 \pm 1.96(0.8)$ .

---

### Question #192 of 193

Question ID: 413277

Which of the following statements about sampling and estimation is *most* accurate?

- A) Time-series data are observations over individual units at a point in time.
- B) A confidence interval estimate consists of a range of values that bracket the parameter with a specified level of probability,  $1 - \beta$ .
- C) A point estimate is a single estimate of an unknown population parameter calculated as a sample mean.

---

### Question #193 of 193

Question ID: 434211

#### Student's *t*-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
30	1.310	1.697	2.042	2.457	2.750	3.646
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373

Based on Student's *t*-distribution, the 95% confidence interval for the population mean based on a sample of 40 interest rates with a sample mean of 4% and a sample standard deviation of 15% is *closest to*:

- A) -0.794% to 8.794%.
- B) -0.851% to 8.851%.

**C)** 1.261% to 6.739%.