

Topic 15: Probabilities

Question #1 of 21

Question ID: 438721

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)** 0.001.
 - C)** 0.167.
 - D)** 0.500.
-

Question #2 of 21

Question ID: 438722

A conditional expectation involves:

- A)** calculating the conditional variance.
 - B)** determining the expected joint probability.
 - C)** refining a forecast because of the occurrence of some other event.
 - D)** estimating the skewness.
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Question #3 of 21

Question ID: 438715

Given the following table about employees of a company based on whether they are smokers or nonsmokers and whether or not they suffer from any allergies, what is the probability of both suffering from allergies and not suffering from allergies?

	<i>Suffer from Allergies</i>	<i>Don't Suffer from Allergies</i>	<i>Total</i>
<i>Smoker</i>	35	25	60
<i>Nonsmoker</i>	55	185	240
<i>Total</i>	90	210	300

- A)** 0.50.
- B)** 0.24.
- C)** 1.00.
- D)** 0.00.

Question #4 of 21

Question ID: 438716

If a fair coin is tossed twice, what is the probability of obtaining heads both times?

- A) 1.
 - B) 1/2.
 - C) 3/4.
 - D) 1/4.
-

Question #5 of 21

Question ID: 438724

If the probability of both a new Wal-Mart and a new Wendy's being built next month is 68% and the probability of a new Wal-Mart being built is 85%, what is the probability of a new Wendy's being built if a new Wal-Mart is built?

- A) 0.85.
 - B) 0.70.
 - C) 0.60.
 - D) 0.80.
-

Question #6 of 21

Question ID: 438708

If X and Y are independent events, which of the following is *most* accurate?

- A) $P(X \text{ or } Y) = P(X) + P(Y)$.
 - B) $P(X | Y) = P(X)$.
 - C) $P(X \text{ or } Y) = (P(X)) \times (P(Y))$.
 - D) X and Y cannot occur together.
-

Question #7 of 21

Question ID: 438725

A joint probability of A and B must always be:

- A) greater than or equal to than the probability of A or B.
- B) greater than or equal to the conditional probability of A given B.
- C) less than or equal to the conditional probability of A given B.
- D) less than the probability of A and the probability of B.

Question #8 of 21

Question ID: 438710

A company says that whether its earnings increase depends on whether it increased its dividends. From this we know:

- A)** $P(\text{both dividend increase and earnings increase}) = P(\text{dividend increase})$.
 - B)** $P(\text{earnings increase} \mid \text{dividend increase})$ is not equal to $P(\text{earnings increase})$.
 - C)** $P(\text{dividend increase} \mid \text{earnings increase})$ is not equal to $P(\text{earnings increase})$.
 - D)** $P(\text{dividend increase or earnings increase}) = P(\text{both dividend and earnings increase})$.
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Question #9 of 21

Question ID: 438717

The probabilities that three students will earn an A on an exam are 0.20, 0.25, and 0.30, respectively. If each student's performance is independent of that of the other two students, the probability that all three students will earn an A is closest to:

- A)** 0.7500.
 - B)** 0.0150.
 - C)** 0.0075.
 - D)** 0.0010.
-

Question #10 of 21

Question ID: 438711

Thomas Baynes has applied to both Harvard and Yale. Baynes has determined that the probability of getting into Harvard is 25% and the probability of getting into Yale (his father's alma mater) is 42%. Baynes has also determined that the probability of being accepted at both schools is 2.8%. What is the probability of Baynes being accepted at either Harvard or Yale?

- A)** 64.2%.
 - B)** 7.7%.
 - C)** 67.0%.
 - D)** 10.5%.
-

Question #11 of 21

Question ID: 438718

An investor has an A-rated bond, a BB-rated bond, and a CCC-rated bond where the probabilities of default over the next three years are 4 percent, 12 percent, and 30 percent, respectively. What is the probability that *all* of these

bonds will default in the next three years if the individual default probabilities are independent?

- A) 46.00%.
 - B) 23.00%.
 - C) 0.14%.
 - D) 1.44%.
-

Question #12 of 21

Question ID: 438726

The probability of a new Wal-Mart being built in town is 64%. If Wal-Mart comes to town, the probability of a new Wendy's restaurant being built is 90%. What is the probability of a new Wal-Mart and a new Wendy's restaurant being built?

- A) 0.675.
 - B) 0.240.
 - C) 0.306.
 - D) 0.576.
-

Question #13 of 21

Question ID: 438723

Dependent random variables are defined as variables where their joint probability is:

- A) not equal to the product of their individual probabilities.
 - B) equal to zero.
 - C) equal to the product of their individual probabilities.
 - D) greater than the product of their individual probabilities.
-

Question #14 of 21

Question ID: 438709

An investor is choosing one of twenty securities. Ten of the securities are stocks and ten are bonds. Four of the ten stocks were issued by utilities, the other six were issued by industrial firms. Two of the ten bonds were issued by utilities, the other eight were issued by industrial firms. If the investor chooses a security at random, the probability that it is a bond or a security issued by an industrial firm is:

- A) 0.70.
- B) 0.50.
- C) 0.60.
- D) 0.80.

Question #15 of 21

Question ID: 438713

If the outcome of event A is not affected by event B, then events A and B are said to be:

- A) statistically independent.
- B) collectively exhaustive.
- C) mutually exclusive.
- D) conditionally dependent.

Question #16 of 21

Question ID: 438714

The following table summarizes the availability of trucks with air bags and bucket seats at a dealership.

	Bucket Seats	No Bucket Seats	Total
Air Bags	75	50	125
No Air Bags	35	60	95
Total	110	110	220

What is the probability of selecting a truck at random that has either air bags or bucket seats?

- A) 107%.
- B) 73%.
- C) 50%.
- D) 34%.

Question #17 of 21

Question ID: 438707

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

- A) An event is a set of one or more possible values of a random variable.
- B) An outcome is the calculated probability of an event.
- C) A conditional probability is the probability that two or more events will happen concurrently.
- D) Out of a sample of 100 widgets 10 were found to be defective, 20 were perfect, and 70 were OK. The probability of picking a perfect widget at random is 29%.

Question #18 of 21

Question ID: 438712

The following table summarizes the availability of trucks with air bags and bucket seats at a dealership.

	<i>Bucket seats</i>	<i>No Bucket Seats</i>	<i>Total</i>
Air Bags	75	50	125
No Air Bags	35	60	95
Total	110	110	220

What is the probability of randomly selecting a truck with air bags and bucket seats?

- A)** 0.16.
 - B)** 0.57.
 - C)** 0.28.
 - D)** 0.34.
-

Question #19 of 21

Question ID: 438706

Let A and B be two mutually exclusive events with $P(A) = 0.40$ and $P(B) = 0.20$. Therefore:

- A)** $P(A \text{ and } B) = 0.08$.
 - B)** $P(B|A) = 0.20$.
 - C)** $P(A \text{ and } B) = 0$.
 - D)** $P(A \text{ or } B) = 0.52$.
-

Question #20 of 21

Question ID: 438719

If two fair coins are flipped and two fair six-sided dice are rolled, all at the same time, what is the probability of ending up with two heads (on the coins) and two sixes (on the dice)?

- A)** 0.8333.
 - B)** 0.4167.
 - C)** 0.0039.
 - D)** 0.0069.
-

Question #21 of 21

Question ID: 438720

X and Y are discrete random variables. The probability that X = 3 is 0.20 and the probability that Y = 4 is 0.30. The

probability of observing that $X = 3$ and $Y = 4$ concurrently is *closest* to:

- A)** 0.
- B)** 0.06.
- C)** Cannot answer with the information provided.
- D)** 0.50.

Topic 16: Basic Statistics

Question #1 of 55

Question ID: 438742

Tully Advisers, Inc., has determined four possible economic scenarios and has projected the portfolio returns for two portfolios for their client under each scenario. Tully's economist has estimated the probability of each scenario as shown in the table below. Given this information, what is the expected return on portfolio A?

Scenario	Probability	Return on Portfolio A	Return on Portfolio B
A	15%	17%	19%
B	20%	14%	18%
C	25%	12%	10%
D	40%	8%	9%

- A)** 9.25%.
- B)** 12.95%.
- C)** 11.55%.
- D)** 10.75%.

Question #2 of 55

Question ID: 438777

When the tails of a distribution are fatter than that implied by a normal distribution, we say that the distribution is:

- A)** platykurtic.
- B)** symmetrical.
- C)** leptokurtic.
- D)** skewed.

Question #3 of 55

Question ID: 438776

A distribution that has positive excess kurtosis:

- A)** has thinner tails than a normal distribution.
 - B)** is more skewed than a normal distribution.
 - C)** is less peaked than a normal distribution.
 - D)** is more peaked than a normal distribution.
-

Question #4 of 55

Question ID: 438766

An investor owns the following portfolio today.

Stock	Market Value	Expected Annual Return
R	\$2,000	17%
S	\$3,200	8%
T	\$2,800	13%

The investor's expected total rate of return (increase in market value) after three years is *closest* to:

- A)** 12.0%.
 - B)** 40.5%.
 - C)** 136.0%.
 - D)** 36.0%.
-

Question #5 of 55

Question ID: 438781

If the variance of the sampling distribution of an estimator is smaller than all other unbiased estimators of the parameter of interest, the estimator is:

- A)** consistent.
 - B)** reliable.
 - C)** efficient.
 - D)** unbiased.
-

Question #6 of 55

Question ID: 438733

The variance of the sum of two independent random variables is equal to the sum of their variances:

- A)** minus a positive covariance term.
- B)** plus a positive covariance term.

- C)** plus a non-zero covariance term.
D) plus zero.
-

Question #7 of 55

Question ID: 438736

Use the following probability distribution to calculate the standard deviation for the portfolio.

<i>State of the Economy</i>	<i>Probability</i>	<i>Return on Portfolio</i>
Boom	0.30	15%
Bust	0.70	3%

- A)** 6.0%.
B) 5.5%.
C) 7.0%.
D) 6.5%.
-

Question #8 of 55

Question ID: 438737

There is a 30% chance that the economy will be good and a 70% chance that it will be bad. If the economy is good, your returns will be 20% and if the economy is bad, your returns will be 10%. What is your expected return?

- A)** 13%.
B) 15%.
C) 17%.
D) 18%.
-

Question #9 of 55

Question ID: 438770

An analyst is currently considering a portfolio consisting of two stocks. The first stock, Remba Co., has an expected return of 12% and a standard deviation of 16%. The second stock, Labs, Inc., has an expected return of 18% and a standard deviation of 25%. The correlation of returns between the two securities is 0.25.

If the analyst forms a portfolio with 30% in Remba and 70% in Labs, what is the portfolio's expected return?

- A)** 15.0%.
B) 17.3%.
C) 21.5%.

D) 16.2%.

Question #10 of 55

Question ID: 438752

Consider the case when the Y variable is in U.S. dollars and the X variable is in U.S. dollars. The 'units' of the covariance between Y and X are:

- A)** a range of values from -1 to +1.
 - B)** squared U.S. dollars.
 - C)** U.S. dollars.
 - D)** the square root of U.S. dollars.
-

Question #11 of 55

Question ID: 438772

Andrew Dawns holds a large position in the common stock of Savory Doughnuts, Inc (Savory). After an extensive executive search, Savory is about to announce a new CEO. There are three candidates for the CEO position, and each is viewed differently by the market. Dawns estimates the following probabilities for the rate of return on Savory's stock in the year following the announcement:

<i>Candidate</i>	<i>Probability of Being Chosen</i>	<i>Rate of Return if Chosen</i>
One	.50	10%
Two	.15	-40%
Three	.35	20%

Based on Dawn's estimates, the expected rate of return on Savory's stock following the announcement of the new CEO is *closest to*:

- A)** 10%.
 - B)** -2%.
 - C)** 9%.
 - D)** 6%.
-

Question #12 of 55

Question ID: 438748

The Y variable is regressed against the X variable resulting in a regression line that is flat with the plot of the paired observations widely dispersed about the regression line. Based on this information, which statement is *most accurate*?

- A)** The R² of this regression is close to 100%.
 - B)** The correlation between X and Y is close to zero.
 - C)** X is perfectly positively correlated to Y.
 - D)** X is perfectly negatively correlated to Y.
-

Question #13 of 55

Question ID: 438775

Left-skewed distributions exhibit:

- A)** a longer tail to the right of the distribution.
 - B)** greater mass to the right of the expected value.
 - C)** greater mass close to the expected value.
 - D)** greater mass to the left of the expected value.
-

Question #14 of 55

Question ID: 438769

As a fund manager, Bryan Cole, CFA, is responsible for assessing the risk and return parameters of the portfolios he oversees. Cole is currently considering a portfolio consisting of only two stocks. The first stock, Remba Co., has an expected return of 12 percent and a standard deviation of 16 percent. The second stock, Labs, Inc., has an expected return of 18 percent and a standard deviation of 25 percent. The correlation of returns between the two securities is 0.25.

Cole has the option of including a third stock in the portfolio. The third stock, Wimset, Inc., has an expected return of 8% and a standard deviation of 10 percent. If Cole constructed an equally weighted portfolio consisting of all three stocks, the portfolio's expected return would be *closest* to:

- A)** 13.9%.
 - B)** 17.1%.
 - C)** 12.7%.
 - D)** 15.9%.
-

Questions #15-17 of 55

Use the following joint probability distribution to answer the questions below.

	Y=1	Y=2	Y=3
X=1	0.05	0.05	0.10
X=2	0.05	0.10	0.15
X=3	0.15	0.15	0.20

Question #15 of 55

Question ID: 438739

The expected value of Y is *closest* to:

- A) 1.0.
- B) 2.3.
- C) 2.2.
- D) 0.2.

Question #16 of 55

Question ID: 438740

If you know that Y is equal to 2, the probability that X is equal to 1 is *closest* to:

- A) 0.05.
- B) 0.25.
- C) 0.20.
- D) 0.17.

Question #17 of 55

Question ID: 438741

The variance of X is *closest* to:

- A) 0.74.
- B) 0.61.
- C) 0.54.
- D) 0.67.

Question #18 of 55

Question ID: 438734

An investor is considering purchasing ACQ. There is a 30% probability that ACQ will be acquired in the next two months. If ACQ is acquired, there is a 40% probability of earning a 30% return on the investment and a 60% probability of earning 25%. If ACQ is not acquired, the expected return is 12%. What is the expected return on this investment?

- A)** 12.3%.
 - B)** 18.3%.
 - C)** 16.5%.
 - D)** 17.4%.
-

Question #19 of 55

Question ID: 438755

The covariance:

- A)** must be less than +1.
 - B)** can be positive or negative.
 - C)** must be between -1 and +1.
 - D)** must be positive.
-

Question #20 of 55

Question ID: 438768

An investor owns the following three-stock portfolio.

Stock	Market Value	Expected Return
A	\$5,000	12%
B	\$3,000	8%
C	\$4,000	9%

The expected return is *closest* to:

- A)** 9.67%.
 - B)** 10.50%.
 - C)** 10.00%.
 - D)** 29.00%.
-

Question #21 of 55

Question ID: 438784

If Estimator A is a more efficient estimator than Estimator B, it will have:

- A)** a smaller mean and a larger variance.
- B)** a smaller mean and the same variance.

- C)** the same mean and a larger variance.
D) the same mean and a smaller variance.
-

Question #22 of 55

Question ID: 438782

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 is normal.
D) sampling distribution of the sample mean has the smallest variance of any other unbiased estimators of the population mean.
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Question #23 of 55

Question ID: 438730

Tully Advisers, Inc., has determined four possible economic scenarios and has projected the portfolio returns for two portfolios for their client under each scenario. Tully's economist has estimated the probability of each scenario, as shown in the table below. Given this information, what is the standard deviation of returns on portfolio A?

Scenario	Probability	Return on Portfolio A	Return on Portfolio B
A	15%	18%	19%
B	20%	17%	18%
C	25%	11%	10%
D	40%	7%	9%

- A)** 8.76%.
B) 5.992%.
C) 4.53%.
D) 1.140%.
-

Question #24 of 55

Question ID: 438773

Suppose you have chosen two stocks with an equity investment screener. The following data has been collected on these two securities:

	Stock A	Stock B
Expected Return	5%	8%
Variance	10%	16%
Covariance (A,B)	0.2	

What is the mean and variance of the sum of the two stock's expected returns and variances assuming the returns are independent of one another?

- A) Mean = 13%; Variance = 26.4%.
 - B) Mean = 6.5%; Variance = 13.4%.
 - C) Mean = 13%; Variance = 26.0%.
 - D) Mean = 6.5%; Variance = 13.0%.
-

Question #25 of 55

Question ID: 438764

Thomas Manx is attempting to determine the correlation between the number of times a stock quote is requested on his firm's website and the number of trades his firm actually processes. He has examined samples from several days trading and quotes and has determined that the covariance between these two variables is 88.6, the standard deviation of the number of quotes is 18, and the standard deviation of the number of trades processed is 14. Based on Manx's sample, what is the correlation between the number of quotes requested and the number of trades processed?

- A) 0.98.
 - B) 0.78.
 - C) 0.18.
 - D) 0.35.
-

Question #26 of 55

Question ID: 438749

Which model does not lend itself to correlation coefficient analysis?

- A) $Y = X^3$.
 - B) $Y = X + 2$.
 - C) $X = Y \times 2$.
 - D) $Y - X = 2$.
-

Question #27 of 55

Question ID: 438761
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For two (possibly dependent) random variables, X and Y, an upper bound on the covariance of X and Y is:

- A) $\sigma(X) \cdot \sigma(Y)$.
 - B) there is no upper bound unless the variables are independent.
 - C) 1.
 - D) zero.
-

Question #28 of 55

Question ID: 438780

In a negatively skewed distribution, what is the order (from lowest value to highest) for the distribution's mode, mean, and median values?

- A) Mode, mean, median.
 - B) Median, mode, mean.
 - C) Mean, median, mode.
 - D) Median, mean, mode.
-

Question #29 of 55

Question ID: 438785

Shawn Choate is thinking about his graduate thesis. Still in the preliminary stage, he wants to choose a variable of study that has the most desirable statistical properties. The statistic he is presently considering has the following characteristics:

- The expected value of the sample mean is equal to the population mean.
- The variance of the sampling distribution is smaller than that for other estimators of the parameter.
- As the sample size increases, the standard error of the sample mean rises and the sampling distribution is centered more closely on the mean.

Select the *best* choice. Choate's estimator is:

- A) unbiased and efficient.
 - B) efficient and consistent.
 - C) unbiased, efficient, and consistent.
 - D) unbiased and consistent.
-

Question #30 of 55

Question ID: 438767

A security has the following expected returns and probabilities of occurrence:

Return	Probability
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10%	40%
12%	40%
15%	20%

What is the expected return of the security?

- A) 11.4%.
 - B) 12.4%.
 - C) 11.8%.
 - D) 12.2%.
-

Question #31 of 55

Question ID: 438783

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) sample mean provides a more accurate estimate of the population mean as the sample size increases.
 - C) sampling distribution of the sample mean is normal.
 - D) sampling distribution of the sample mean has the smallest variance of any other unbiased estimators of the population mean.
-

Question #32 of 55

Question ID: 438763

The covariance of returns on two investments over a 10-year period is 0.009. If the variance of returns for investment A is 0.020 and the variance of returns for investment B is 0.033, what is the correlation coefficient for the returns?

- A) 0.444.
 - B) 0.350.
 - C) 0.687.
 - D) 0.785.
-

Question #33 of 55

Question ID: 438754

The correlation coefficient for two dependent random variables is equal to:

- A) the covariance between the random variables divided by the product of the variances.

- B)** the product of the standard deviations for the two random variables divided by the covariance.
 - C)** the absolute value of the difference between the means of the two variables divided by the product of the variances.
 - D)** the covariance between the random variables divided by the product of the standard deviations.
-

Question #34 of 55

Question ID: 438751

Which of the following statements about the correlation coefficient is **TRUE**? The correlation coefficient is:

- A)** bounded between 0 and +1.
 - B)** boundless.
 - C)** bounded between -1 and 0.
 - D)** bounded between -1 and +1.
-

Question #35 of 55

Question ID: 438732

The characteristic function of the product of independent random variables is equal to the:

- A)** square root of the product of the individual characteristic functions.
 - B)** sum of the individual characteristic functions.
 - C)** product of the individual characteristic functions.
 - D)** exponential root of the product of the individual characteristic functions.
-

Question #36 of 55

Question ID: 438760

A scatter plot is a collection of points on a graph where each point represents the values of two variables (i.e., an X/Y pair). The pattern of data points will illustrate a correlation between these two variables that is between:

- A)** slope of -1 and slope of +1.
 - B)** -0.7 and +0.7.
 - C)** -1 to +1.
 - D)** 0 and +1.
-

Question #37 of 55

Question ID: 438747

A bond analyst is looking at historical returns for two bonds, Bond 1 and Bond 2. Bond 2's returns are much more volatile than Bond 1. The variance of returns for Bond 1 is 0.012 and the variance of returns of Bond 2 is 0.308. The correlation between the returns of the two bonds is 0.79, and the covariance is 0.048. If the variance of Bond 1 increased to 0.026 while the variance of Bond B decreased to 0.188 and the covariance remains the same, the correlation between the two bonds will:

- A)** increase.
 - B)** the values given are not plausible.
 - C)** remain the same.
 - D)** decrease.
-

Question #38 of 55

Question ID: 438757

In order to have a negative correlation between two variables, which of the following is *most* accurate?

- A)** The covariance must be negative.
 - B)** Either the covariance or one of the standard deviations must be negative.
 - C)** The covariance can never be negative.
 - D)** Both the covariance and at least one of the standard deviations must be negative.
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Question #39 of 55

Question ID: 438774

Mike Palm, CFA, is an analyst with a large money management firm. Currently, Palm is considering the risk and return parameters associated with Alux, a small technology firm. After in depth analysis of the firm and the economic outlook, Palm estimates the following return probabilities:

Probability (P_i)	Return (R_i)
0.3	-5%
0.5	15%
0.2	25%

Palm's objective is to quantify the risk/return relationship for Alux.

Given the returns and probability estimates above, what is the expected return for Alux?

- A)** 45%.
 - B)** 15%.
 - C)** 11%.
 - D)** 9%.
-

Question #40 of 55

Question ID: 438731

An analyst has knowledge of the beginning-of-period expected returns, standard deviations of return, and market value weights for the assets that comprise a portfolio. The analyst does not require the covariances of returns between asset pairs to calculate the:

- A)** reduction in risk due to diversification.
 - B)** correlations between asset pairs.
 - C)** variance of the return on the portfolio.
 - D)** expected return on the portfolio.
-

Questions #41-43 of 55

	Y = 1	Y = 2	Y = 3
X = 1	0.05	0.15	0.20
X = 2	0.15	0.15	0.30

Question #41 of 55

Question ID: 438744

The expected value of X is closest to:

- A)** 1.8
- B)** 1.5
- C)** 1.2
- D)** 1.6

Question #42 of 55

Question ID: 438745

If you know that X is equal to 1, the probability that Y is equal to 2 is closest to:

- A)** 0.15
- B)** 0.30
- C)** 0.38
- D)** 0.50

Question #43 of 55

Question ID: 438746

The variance of Y is closest to:

- A)** 1.51
 - B)** 0.61
 - C)** 0.76
 - D)** 2.27
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Question #44 of 55

Question ID: 438771

A security has the following expected returns and probabilities of occurrence:

<i>Return</i>	<i>Probability</i>
6.1%	10%
7.5%	40%
9.2%	50%

What is the expected return of the security?

- A)** 7.8%.
 - B)** 8.4%.
 - C)** 8.2%.
 - D)** 7.6%.
-

Question #45 of 55

Question ID: 438735

A two-sided but very thick coin is expected to land on its edge twice out of every 100 flips. And the probability of face up (heads) and the probability of face down (tails) are equal. When the coin is flipped, the prize is \$1 for heads, \$2 for tails, and \$50 when the coin lands on its edge. What is the expected value of the prize on a single coin toss?

- A)** \$26.50.

- B)** \$2.47.
 - C)** \$1.50.
 - D)** \$17.67.
-

Question #46 of 55

Question ID: 438762

SCU and QXA are two stocks in the same industry. The variance of returns for each stock is 0.3025 and the returns are perfectly positively correlated. The covariance between the returns is closest to:

- A)** 0.1000.
 - B)** 0.3025.
 - C)** 0.2525.
 - D)** 0.5500.
-

Question #47 of 55

Question ID: 438753

Which of the following statements is least accurate regarding covariance?

- A)** Covariance can be negative.
 - B)** A covariance of zero rules out any relationship.
 - C)** Covariance can exceed one.
 - D)** Covariance can only apply to two variables at a time.
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Question #48 of 55

Question ID: 438756

If X and Y are independent random variables:

- A)** the correlation between the two variables is equal to zero.
 - B)** the variables are perfectly correlated.
 - C)** The covariance between the two variables is equal to zero and the correlation between the two variables is equal to zero.
 - D)** the covariance between the two variables is equal to zero.
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Question #49 of 55

Question ID: 438765

Rafael Garza, CFA, is considering the purchase of ABC stock for a client's portfolio. His analysis includes calculating the covariance between the returns of ABC stock and the equity market index. Which of the following statements regarding Garza's analysis is *most* accurate?

- A)** The covariance of two variables is an easier measure to interpret than the correlation coefficient.
 - B)** The actual value of the covariance is not very meaningful because the measurement is very sensitive to the scale of the two variables.
 - C)** The covariance measures the strength of the linear relationship between two variables.
 - D)** A covariance of +1 indicates a perfect positive covariance between the two variables.
-

Question #50 of 55

Question ID: 438750

Suppose the covariance between Y and X is 12, the variance of Y is 25, and the variance of X is 36. What is the correlation coefficient (r), between Y and X?

- A)** 0.400.
 - B)** 0.000.
 - C)** 0.160.
 - D)** 0.013.
-

Question #51 of 55

Question ID: 438758

Determine and interpret the correlation coefficient for the two variables X and Y. The standard deviation of X is 0.05, the standard deviation of Y is 0.08, and their covariance is -0.003.

- A)** -1.33 and the two variables are negatively associated.
 - B)** +1.33 and the two variables are positively associated.
 - C)** +0.75 and the two variables are positively associated.
 - D)** -0.75 and the two variables are negatively associated.
-

Question #52 of 55

Question ID: 438759

For the case of simple linear regression with one independent variable, which of the following statements about the correlation coefficient is *least* accurate?

- A)** The correlation coefficient can vary between -1 and +1.
- B)** If the regression line is flat and the observations are dispersed uniformly about the line, the correlation coefficient will be +1.

- C)** The correlation coefficient describes the strength of the relationship between the X variable and the Y variable.
- D)** If the correlation coefficient is negative, it indicates that the regression line has a negative slope coefficient.
-

Question #53 of 55

Question ID: 438778

It is often said that stock returns are leptokurtic. If this is true, relative to a normal distribution of the same mean and variance, the distribution of stock returns is:

- A)** positively skewed.
- B)** thin-tailed.
- C)** fat-tailed.
- D)** negatively skewed.
-

Question #54 of 55

Question ID: 438779

In a positively skewed distribution, what is the order (from lowest value to highest) for the distribution's mode, mean, and median values?

- A)** Mean, median, mode.
- B)** Median, mean, mode.
- C)** Mode, mean, median.
- D)** Mode, median, mean.
-

Question #55 of 55

Question ID: 438624

Gregg Goebel and Mason Erikson are studying for the Level I CFA examination. They have just started the section on Portfolio Management and Erikson is having difficulty with the equations for the covariance ($\text{cov}_{1,2}$) and the correlation coefficient ($r_{1,2}$) for two-stock portfolios. Goebel is confident with the material and creates the following quiz for Erikson. Using the information in the table below, he asks Erickson to fill in the question marks.

	<i>Portfolio J</i>	<i>Portfolio K</i>	<i>Portfolio L</i>
Number of Stocks	2	2	2
Covariance	?	$\text{cov}_{1,2} = 0.020$	$\text{cov}_{1,2} = 0.003$
Correlation coefficient	$r_{1,2} = 0.750$?	?

Risk measure Stock 1	Std. Deviation ₁ = 0.08	Std. Deviation ₁ = 0.20	Std. Deviation ₁ = 0.18
Risk measure Stock 2	Std. Deviation ₂ = 0.18	Std. Deviation ₂ = 0.12	Variance ₂ = 0.09

Which of the following choices correctly gives the covariance for Portfolio J and the correlation coefficients for Portfolios K and L?

Portfolio J

Portfolio K

Portfolio L

- A)** 0.011 0.002 0.076
- B)** 1.680 0.833 0.056
- C)** 1.680 0.002 0.076
- D)** 0.011 0.833 0.056

Topic 17: Distributions

Question #1 of 32

Question ID: 438794

The probability of returns less than -10%, assuming a normal distribution with expected return of 6.5% and standard deviation of 10%, is:

- A) less than 2.5%.
 - B) approximately 5%.
 - C) not defined with only this information.
 - D) approximately 10%.
-

Question #2 of 32

Question ID: 438810

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) 61.
 - B) 60.
 - C) 59.
 - D) 58.
-

Question #3 of 32

Question ID: 438806

The annual returns for a portfolio are normally distributed with an expected value of £50 million and a standard deviation of £25 million. What is the probability that the value of the portfolio one year from today will be between £91.13 million and £108.25 million?

- A) 0.040.
 - B) 0.075.
 - C) 0.025.
 - D) 0.090.
-

Question #4 of 32

Question ID: 438787

For a normal distribution, what approximate percentage of the observations falls within ± 2 standard deviations of the

mean?

- A)** 95%.
 - B)** 90%.
 - C)** 92%.
 - D)** 99%.
-

Question #5 of 32

Question ID: 438793

The return on a portfolio is normally distributed with a mean return of 8 percent and a standard deviation of 18 percent. Which of the following is *closest* to the probability that the return on the portfolio will be between -27.3 percent and 37.7 percent?

- A)** 92.5%.
 - B)** 96.5%.
 - C)** 81.5%.
 - D)** 68.0%.
-

Question #6 of 32

Question ID: 438790

A normal distribution can be completely described by its:

- A)** mean and mode.
 - B)** mean and variance.
 - C)** skewness and kurtosis.
 - D)** standard deviation.
-

Question #7 of 32

Question ID: 438796

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

- A)** less than 5% is 0.16.
- B)** greater than 35% is 0.025.
- C)** between 5% and 25% is 0.68.
- D)** greater than 25% is 0.32.

Question #8 of 32

Question ID: 438788

An analyst has determined that the probability that the S&P 500 index will increase on any given day is 0.60 and the probability that it will decrease is 0.40. The expected value and variance of the number of up days in a 5-day period are closest to:

- A) 3.0 and 1.1.
 - B) 3.0 and 1.2.
 - C) 2.0 and 0.5.
 - D) 2.0 and 2.1.
-

Question #9 of 32

Question ID: 438816

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

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

Question #10 of 32

Question ID: 438809

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

Question #11 of 32

Question ID: 438798

The lower limit of a normal distribution is:

- A) one.

- B)** zero.
 - C)** negative one.
 - D)** negative infinity.
-

Question #12 of 32

Question ID: 438786

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

- A)** Five percent of the normal curve probability falls more than outside two standard deviations from the mean.
 - B)** The standardized normal distribution has a mean of zero and a standard deviation of 10.
 - C)** Sixty-eight percent of the area under the normal curve falls between 0 and +1 standard deviations above the mean.
 - D)** The normal curve is asymmetrical about its mean.
-

Question #13 of 32

Question ID: 438818

Which of the following statements is true regarding the mixture of distributions for risk modeling?

- I. Distributions should never be combined.
 - II. It may be helpful to create a new distribution if the underlying data you are working with does not currently fit a pre-determined distribution.
- A)** II only.
 - B)** Both I and II.
 - C)** Neither I nor II.
 - D)** I only.
-

Questions #14-15 of 32

A study of hedge fund investors found that their household incomes are normally distributed with a mean of \$280,000 and a standard deviation of \$40,000.

Question #14 of 32

Question ID: 438813

The percentage of hedge fund investors that have incomes *greater* than \$350,000 is *closest* to:

- A)** 3.0%.
- B)** 25.0%.

- C) 5.0%.
- D) 4.0%.

Question #15 of 32

Question ID: 438814

The percentage of hedge fund investors with income *less* than \$180,000 is *closest* to:

- A) 2.50%.
 - B) 1.15%.
 - C) 0.62%.
 - D) 6.48%.
-

Question #16 of 32

Question ID: 438795

Which of the following statements is incorrect regarding a Bernoulli distributed random variable.

- I. It only has three possible outcomes.
 - II. It is commonly used for assessing whether or not a company defaults during a specified time period.
- A) Both I and II.
 - B) I only.
 - C) Neither I nor II.
 - D) II only.
-

Question #17 of 32

Question ID: 438801

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) 15.87%.
 - B) 2.50%.
 - C) 34.13%.
 - D) 5.00%.
-

Question #18 of 32

Question ID: 738646
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The distribution of annual returns for a bond portfolio is approximately normal with an expected value of \$120 million and a standard deviation of \$20 million. Which of the following is *closest* to the probability that the value of the portfolio one year from today will be between \$110 million and \$170 million?

- A) 66%.
 - B) 74%.
 - C) 42%.
 - D) 58%.
-

Question #19 of 32

Question ID: 438811

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.
 - D) Binomial distribution.
-

Question #20 of 32

Question ID: 438799

Regarding a binomially distributed random variable, the variance of the number of successes, X , where n equals the number of trials and p equals the probability of success, is most likely equal to:

- A) $np(1 - p)$.
 - B) $p(1-p)$.
 - C) p .
 - D) np .
-

Question #21 of 32

Question ID: 438791

A call center receives an average of two phone calls per hour. The probability that they will receive 20 calls in an 8-hour day is *closest* to:

- A) 3.66%.
- B) 5.59%.
- C) 6.40%.
- D) 16.56%.

Question #22 of 32

Question ID: 438800

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

- A) One of the key properties of a probability function is $0 \leq p \leq 1$.
 - B) In a binomial distribution each observation has only two possible outcomes that are mutually exclusive.
 - C) A probability distribution includes a listing of all the possible outcomes of an experiment.
 - D) A probability distribution is, by definition, normally distributed.
-

Question #23 of 32

Question ID: 438792

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) 50%.
 - B) 84%.
 - C) 98%.
 - D) 34%.
-

Question #24 of 32

Question ID: 438804

Given the probabilities $N(-0.5) = 0.3085$, $N(0.75) = 0.7734$, and $N(1.50) = 0.9332$ from a z-table, the probability of 0.2266 corresponds to:

- A) $N(0.50)$.
 - B) $N(-0.25)$.
 - C) $N(-0.75)$.
 - D) $N(0.25)$.
-

Question #25 of 32

Question ID: 438817

To apply the central limit theorem to the sampling distribution of the sample mean, the sample is usually considered to be large if n is greater than:

- A) 15.

- B)** 30.
 - C)** 25.
 - D)** 20.
-

Question #26 of 32

Question ID: 438802

Standardizing a normally distributed random variable requires the:

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

Question #27 of 32

Question ID: 438808

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 is flatter with less area under the tails.
 - C)** Compared to the normal distribution, the t-distribution is more peaked with more area under the tails.
 - D)** The t-distribution is the appropriate distribution to use when constructing confidence intervals based on large samples.
-

Question #28 of 32

Question ID: 438797

Approximately 50 percent of all observations for a normally distributed random variable fall in the interval:

- A)** $\mu \pm 2\sigma$
 - B)** $\mu \pm 3\sigma$
 - C)** $\mu \pm 0.67\sigma$
 - D)** $\mu \pm \sigma$
-

Question #29 of 32

Question ID: 438789

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

- A) Approximately 68% of the observations lie within +/- 1 standard deviation of the mean.
 - B) A normal distribution has excess kurtosis of three.
 - C) The mean and variance completely define a normal distribution.
 - D) The mean, median, and mode are equal.
-

Question #30 of 32

Question ID: 438815

The central limit theorem concerns the sampling distribution of the:

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

Question #31 of 32

Question ID: 438807

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

- A) skewed, defined by a single parameter and is less peaked than the normal distribution.
 - B) symmetrical, defined by a single parameter and is less peaked than the normal distribution.
 - C) symmetrical, defined by two parameters and is less peaked than the normal distribution.
 - D) skewed, defined by a single parameter and is more peaked than the normal distribution.
-

Question #32 of 32

Question ID: 438803

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) 0.950.
- C) 1.000.

D) 0.750.

Topic 18: Bayesian Analysis

Question #1 of 5

Question ID: 438728

The probability of A is 0.4. The probability of A^C is 0.6. The probability of $(B|A)$ is 0.5, and the probability of $(B|A^C)$ is 0.2. Using Bayes' formula, what is the probability of $(A|B)$?

- A)** 0.125.
 - B)** 0.625.
 - C)** 0.875.
 - D)** 0.375.
-

Question #2 of 5

Question ID: 438729

Bonds rated B have a 25% chance of default in five years. Bonds rated CCC have a 40% chance of default in five years. A portfolio consists of 30% B and 70% CCC-rated bonds. If a randomly selected bond defaults in a five-year period, what is the probability that it was a B-rated bond?

- A)** 0.211.
 - B)** 0.250.
 - C)** 0.429.
 - D)** 0.625.
-

Question #3 of 5

Question ID: 496381

Assume that sample performance data indicates that a hedge fund manager underperformed the market in each of the last four years. If only the previous four years of data is included in the sample, what would the frequentist approach predict as the probability that this manager will underperform the market again next year?

- A)** 100%.
 - B)** 0%.
 - C)** 50%.
 - D)** 75%.
-

Question #4 of 5

Question ID: 496382

When updating a given set of prior probabilities, analysts in practice will most likely use which of the following approaches when the data sample size is very large?

- A)** The Bayesian approach.
 - B)** The loss distribution approach.
 - C)** The F-distribution approach.
 - D)** The frequentist approach.
-

Question #5 of 5

Question ID: 438727

A major securities exchange is considering the introduction of a new derivative contract. In the past, the success rate for new derivatives has been 30 percent. Extensive market research has produced a positive marketing research report for the contract under consideration. Historically, 70 percent of reports prior to introduction have been favorable given successful contracts. Only 10 percent have received favorable reports given unsuccessful contracts. What is the probability that the new contract will be successful given a favorable report?

- A)** 75%.
- B)** 25%.
- C)** 13%.
- D)** 87%.

Topic 19: Hypothesis Testing and Confidence Intervals

Questions #1-4 of 82

Two samples were drawn from a normally distributed population. For the first sample, the mean was \$50, and the standard deviation was \$5. For the second sample, the mean was \$55, and the standard deviation was \$6. The first sample consists of 25 observations, and the second sample consists of 36 observations. (*Note: In the following questions, the subscripts "1" and "2" indicate the first and second sample, respectively.*)

Question #1 of 82

Question ID: 438905

Consider the hypotheses structured as $H_0: \mu_1 = \$48$ versus $H_a: \mu_1 \neq \$48$. At a 1 percent level of significance, the null hypothesis:

- A) should be rejected.
- B) cannot be rejected.
- C) cannot be tested using this sample information provided.
- D) should neither be rejected nor fail to be rejected.

Question #2 of 82

Question ID: 438906

Using a 5 percent level of significance and a hypothesis test structure of $H_0: \sigma_1^2 \leq 24$ versus $H_a: \sigma_1^2 > 24$, the null hypothesis:

- A) cannot be rejected.
- B) cannot be tested using this sample information provided.
- C) should neither be rejected nor fail to be rejected.
- D) should be rejected.

Question #3 of 82

Question ID: 438907

Consider the hypotheses structured as $H_0: \mu_1 \leq \$48$ versus $H_a: \mu_1 > \$48$. At a 5 percent level of significance, the null hypothesis:

- A) should neither be rejected nor fail to be rejected.
- B) cannot be rejected.
- C) should be rejected.
- D) cannot be tested using the sample information provided.

Question #4 of 82

Question ID: 895767

Using a 5 percent level of significance for a test of the null of $H_0: \sigma_1 = \sigma_2$ versus the alternative of $H_a: \sigma_1 \neq \sigma_2$, the null hypothesis:

- A)** should neither be rejected nor fail to be rejected.
- B)** cannot be tested using the sample information provided.
- C)** should be rejected.
- D)** cannot be rejected.
-

Question #5 of 82

Question ID: 438899

What is the computed value of the test statistic that follows an *F*-distribution when sample variances are equal and the level of significance is 0.10?

- A)** 0.90.
- B)** 1.00.
- C)** 0.05.
- D)** 0.10.
-

Question #6 of 82

Question ID: 438821

Assume that the following returns are a sample of annual returns for firms in the clothing industry. Given the following sample of returns, what are the sample variance and standard deviation?

<i>Firm 1</i>	<i>Firm 2</i>	<i>Firm 3</i>	<i>Firm 4</i>	<i>Firm 5</i>
15%	2%	5%	(7%)	0%

Variance Standard Deviation

- A)** 64.5 8.0
- B)** 22.0 4.7
- C)** 51.6 7.2
- D)** 32.4 5.7
-

Question #7 of 82

Question ID: 438832

A sample covariance of two random variables is most commonly utilized to:

- A)** identify and measure strong nonlinear relationships between the two variables.
- B)** demonstrate either the presence or absence of spurious correlation of the variables.

- C)** calculate the correlation coefficient, which is a measure of the strength of their linear relationship.
- D)** estimate the "pure" measure of the tendency of two variables to move together over a period of time.
-

Question #8 of 82

Question ID: 438836

The mean and variance of a sample average help define the distributional characteristics of a sample distribution and allow assumptions to be made about this distribution when the sample size is large. Which of the following choices represent the standard deviation of a sample average?

- A)** $1/n$.
- B)** $\sigma(X)^2/n$.
- C)** $\sigma(X)^2$
- D)** $\sigma(X)/\sqrt{n}$.
-

Question #9 of 82

Question ID: 438868

A Type I error occurs when the null hypothesis:

- A)** fails to be rejected when it is false.
- B)** fails to be rejected when it is true.
- C)** is rejected when it is true.
- D)** is rejected when it is false.
-

Question #10 of 82

Question ID: 438866

Maria Huffman is the Vice President of Human Resources for a large regional car rental company. Last year, she hired Graham Brickley as Manager of Employee Retention. Part of the compensation package was the chance to earn one of the following two bonuses: if Brickley can reduce turnover to less than 30%, he will receive a 25% bonus. If he can reduce turnover to less than 25%, he will receive a 50% bonus (using a significance level of 10%). The population of turnover rates is normally distributed. The population standard deviation of turnover rates is 1.5%. A recent sample of 100 branch offices resulted in an average turnover rate of 24.2%. Which of the following statements is *most* accurate?

- A)** Brickley should not receive either bonus.
- B)** For the 50% bonus level, the test statistic is -5.33 and Huffman should give Brickley a 50% bonus.
- C)** For the 25% bonus level, the test statistic is -10.66.

- D)** For the 50% bonus level, the critical value is -1.65 and Huffman should give Brickley a 50% bonus.
-

Question #11 of 82

Question ID: 438871

A Type I error:

- A)** rejects a false null hypothesis.
 - B)** fails to reject a true null hypothesis.
 - C)** rejects a true null hypothesis.
 - D)** fails to reject a false null hypothesis.
-

Question #12 of 82

Question ID: 438847

A random sample of 100 technology stocks earned an average of 10%. Assuming the distribution of equity returns is normal and the population standard deviation is 5%, the 95% confidence interval for the population mean is:

- A)** 9.91% to 10.90%.
 - B)** 9.02% to 10.98%.
 - C)** 9.50% to 10.50%.
 - D)** 5.00% to 15.00%.
-

Questions #13-16 of 82

An analyst is testing to see if the mean of a population is less than 133. A random sample of 50 observations had a mean of 130. Assume a standard deviation of 5. The test is to be made at the 1% level of significance.

<i>z</i>	0.00	0.01	0.02	0.03	0.04	0.05	0.06
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750

2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931

Question #13 of 82

Question ID: 438861

The null hypothesis is:

- A)** $\mu > 133$.
- B)** $\mu \geq 133$.
- C)** $\mu \leq 133$.
- D)** $\mu = 133$.

Question #14 of 82

Question ID: 438862

The calculated test statistic is:

- A)** +1.33.
- B)** -3.00.
- C)** -1.33.
- D)** -4.24.

Question #15 of 82

Question ID: 438863

The critical value is:

- A)** -2.33.
- B)** -2.38.
- C)** 2.47.
- D)** 2.17.

Question #16 of 82

Question ID: 438864

You should:

- A)** accept the null hypothesis.
- B)** reject the alternative hypothesis.
- C)** reject the null hypothesis.
- D)** Cannot be determined with the information given.

Question #17 of 82

Question ID: 438873

A survey is taken to determine whether the average starting salaries of CFA charterholders is equal to or greater than \$59,000 per year. What is the test statistic given a sample of 135 newly acquired CFA charterholders with a mean starting salary of \$64,000 and a standard deviation of \$5,500?

- A)** 0.91.
 - B)** -0.91.
 - C)** 10.56.
 - D)** -10.56.
-

Question #18 of 82

Question ID: 438856

The first step in the process of hypothesis testing is:

- A)** the collection of the sample.
 - B)** to state the hypotheses.
 - C)** the calculation of sample statistics.
 - D)** selecting the test statistic.
-

Question #19 of 82

Question ID: 438846

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)** \$0.5100 to \$1.4900.
 - C)** \$0.8657 to \$1.1343.
 - D)** \$0.7713 to \$1.2287.
-

Question #20 of 82

Question ID: 438855

Which of the following statements *least* describes the procedure for testing a hypothesis?

- A)** Develop a hypothesis, compute the test statistic, and make a decision.
- B)** Select the level of significance, formulate the decision rule, and make a decision.
- C)** Select the level of significance, compute the test statistic, and make a decision.

- D)** Compute the sample value of the test statistic, set up a rejection (critical) region, and make a decision.
-

Question #21 of 82

Question ID: 438854

Which of the following is the correct sequence of events for testing a hypothesis?

- A)** State the hypothesis, select the level of significance, compute the test statistic, formulate the decision rule, and make a decision.
 - B)** State the hypothesis, select the level of significance, formulate the decision rule, compute the test statistic, and make a decision.
 - C)** State the hypothesis, formulate the decision rule, select the level of significance, compute the test statistic, and make a decision.
 - D)** State the hypothesis, formulate the decision rule, compute the test statistic, select the level of significance, and make a decision.
-

Question #22 of 82

Question ID: 438880

Given the following hypothesis:

- The null hypothesis is $H_0 : \mu = 5$
- The alternative is $H_1 : \mu \neq 5$
- The mean of a sample of 17 is 7
- The population standard deviation is 2.0

What is the calculated z-statistic?

- A)** 8.25.
 - B)** 4.12.
 - C)** 4.00.
 - D)** 8.00.
-

Question #23 of 82

Question ID: 438851

Susan Bellows is comparing the return on equity for two industries. She is convinced that the return on equity for the discount retail industry (DR) is greater than that of the luxury retail (LR) industry. What are the hypotheses for a test of her comparison of return on equity?

- A)** $H_0: \mu_{DR} \leq \mu_{LR}$ versus $H_a: \mu_{DR} > \mu_{LR}$.

-
- B)** $H_0: \mu_{DR} \neq \mu_{LR}$ versus $H_a: \mu_{DR} = \mu_{LR}$.
- C)** $H_0: \mu_{DR} = \mu_{LR}$ versus $H_a: \mu_{DR} \neq \mu_{LR}$.
- D)** $H_0: \mu_{DR} = \mu_{LR}$ versus $H_a: \mu_{DR} < \mu_{LR}$.

Question #24 of 82

Question ID: 438850

A sample of size 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, m .

- A)** $15 \pm 1.96(0.4)$.
- B)** $15 \pm 1.96(0.8)$.
- C)** $15 \pm 1.96(2)$.
- D)** $15 \pm 1.96(4)$.

Question #25 of 82

Question ID: 438900

In order to test if Stock A is more volatile than Stock B, prices of both stocks are observed to construct the sample variance of the two stocks. The appropriate test statistics to carry out the test is the:

- A)** Chi-square test.
- B)** t test.
- C)** F test.
- D)** Z test.

Question #26 of 82

Question ID: 438849

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)** 1.584% to 14.584%.
- B)** 1.546% to 13.454%.
- C)** -1.584% to 15.584%.
- D)** 0.546% to 13.454%.

Question #27 of 82

Question ID: 438835

The table below shows a sample of returns on two securities:

Period	1	2	3	4	Mean
Security P	0.2%	0.5%	1.1%	-0.6%	0.3%
Security Q	-0.3%	0.9%	1.5%	-0.5%	0.4%

The sample covariance between the two securities' returns is closest to:

- A) 1.86.
 - B) 0.47.
 - C) 0.78.
 - D) 0.62.
-

Question #28 of 82

Question ID: 438820

The mean equity risk premium over a 40-year period is equal to 8.0 percent. The standard deviation of the sample is 12 percent. The standard error of the sample mean is *closest* to:

- A) 1.26%.
 - B) 8.00%.
 - C) 0.30%.
 - D) 1.90%.
-

Question #29 of 82

Question ID: 438830

You observe the following annual returns on a stock portfolio for the last nine years: [5%, 7%, 20%, -4%, 2%, 5%, 13%, 18%, 4%]. Which measure of central tendency has the highest value?

- A) The median.
 - B) For these observations, the mean, median, and mode are equal.
 - C) The mean.
 - D) The mode.
-

Question #30 of 82

Question ID: 438834

You observe the following pairs of annual returns on a sample of two stocks: (0.13, 0.1), (0.08, 0.06), (0.07, 0.05),

(0.13, 0.08)]. The covariance of the returns on the two stocks is *closest* to:

- A)** 0.00165.
 - B)** 0.0033.
 - C)** 0.0008.
 - D)** 0.0011.
-

Question #31 of 82

Question ID: 438875

A return series with 250 observations has a sample mean of 10 percent and a standard deviation of 15 percent. The standard error of the sample mean is *closest* to:

- A)** 3.87.
 - B)** 0.95.
 - C)** 15.80.
 - D)** 0.06.
-

Question #32 of 82

Question ID: 438848

The 95 percent confidence interval of the sample mean of the price earnings ratio for all traded stocks is 19 to 44. There are over 5,000 traded stocks and the sample size of this test is 100. Given that the expected value of the price earnings ratio is 31.5, the standard error of the ratio is *closest* to:

- A)** 6.38.
 - B)** 1.96.
 - C)** 2.58.
 - D)** 12.50.
-

Question #33 of 82

Question ID: 438881

The mean monthly return for an equity portfolio over 60 months is 1.5%. The standard deviation is 3.0%. The value of the test statistic to test the hypothesis that mean monthly return is equal to zero is *closest* to:

- A)** 3.87.
- B)** 30.00
- C)** 0.50.
- D)** 2.19.

Question #34 of 82

Question ID: 438872

In a two-tailed test of a hypothesis concerning whether a population mean is zero, Jack Olson computes a t -statistic of 2.7 based on a sample of 20 observations where the distribution is normal. If a 5% significance level is chosen, Olson should:

- A) reject the null hypothesis and conclude that the population mean is not significantly different from zero.
- B) fail to reject the null hypothesis that the population mean is not significantly different from zero.
- C) not make a conclusion pending additional observations.
- D) reject the null hypothesis and conclude that the population mean is significantly different from zero.

Questions #35-37 of 82

John Starwall, CFA, is assigned the task of estimating the risk and return for security X, which is being considered as an addition to his current portfolio. If the investment is accepted, then the total portfolio will consist of five different equities that are not highly correlated. Security X has an estimated beta of 1.4. The probabilities of various states of the economy and the expected return for security X given each state are as follows:

<i>State of Economy</i>	P_i	$E(R_i)$
Recession	0.3	0.01
Average Economy	0.6	0.10
Boom	0.1	0.20

Question #35 of 82

Question ID: 438823

Based on the information above, what is the estimated expected return for security X?

- A) 8.0%.
- B) 10.0%.
- C) 15.5%.
- D) 8.3%.

Question #36 of 82

Question ID: 438824

Based on the information above, what is the estimated standard deviation for security X?

- A) 7.8%.
- B) 10.1%.
- C) 0.3%.
- D) 5.6%.

Question #37 of 82

Question ID: 438825

Based on the information above, what are the appropriate measures for assessing whether or not this security should be added to the portfolio?

- A) Expected return and beta of the security.
 - B) Beta and standard deviation of the security.
 - C) Expected return and standard deviation of the security.
 - D) Expected return, beta, and standard deviation of the security.
-

Question #38 of 82

Question ID: 438867

A bottler of iced tea wishes to ensure that an average of 16 ounces of tea is in each bottle. In order to analyze the accuracy of the bottling process, a random sample of 150 bottles is taken. Using a *t*-distributed test statistic of -1.09 and a 5% level of significance, the bottler should:

- A) reject the null hypothesis and conclude that bottles contain an average 16 ounces of tea.
 - B) not reject the null hypothesis and conclude that bottles do not contain an average of 16 ounces of tea.
 - C) not reject the null hypothesis and conclude that bottles contain an average 16 ounces of tea.
 - D) reject the null hypothesis and conclude that bottles do not contain an average of 16 ounces of tea.
-

Question #39 of 82

Question ID: 438852

Brian Ci believes that the average return on equity in the airline industry, μ , is less than 5%. What are the appropriate null (H_0) and alternative (H_a) hypotheses to test this belief?

- A)** $H_0: \mu < 0.05$ versus $H_a: \mu > 0.05$.
 - B)** $H_0: \mu < 0.05$ versus $H_a: \mu \geq 0.05$.
 - C)** $H_0: \mu \geq 0.05$ versus $H_a: \mu < 0.05$.
 - D)** $H_0: \mu > 0.05$ versus $H_a: \mu < 0.05$.
-

Questions #40-44 of 82

An analyst is conducting a hypothesis test to determine if the mean time spent on investment research is different from 3 hours per day. The test is performed at the 5 percent level of significance and uses a random sample of 64 portfolio managers, where the mean time spent on research is found to be 2.5 hours. The population standard deviation is 1.5 hours.

Question #40 of 82

Question ID: 438884

The appropriate null hypothesis for the described test is:

- A)** $H_0: \mu \neq 3$ hours.
- B)** $H_0: \mu = 3$ hours.
- C)** $H_0: \mu \leq 3$ hours.
- D)** $H_0: \mu \geq 3$ hours.

Question #41 of 82

Question ID: 438885

Which type of test is this?

- A)** Two-tailed test.
- B)** One-tailed test.
- C)** Equity of variance test.
- D)** Chi-square test.

Question #42 of 82

Question ID: 438886

The calculated z-statistic is:

- A)** +2.67.
- B)** -2.67.
- C)** -2.13.
- D)** +0.33.

Question #43 of 82

Question ID: 438887

The critical z-value(s) of the test statistic is (are):

- A)** ± 1.96 .
- B)** -1.96 .
- C)** ± 2.58 .
- D)** $+1.96$.

Question #44 of 82

Question ID: 438888

Which of the following decisions is the **CORRECT** decision for this study?

- A)** No decision is possible because the sample standard deviation was not given.
 - B)** Fail to reject the null hypothesis.
 - C)** Reject the null hypothesis.
 - D)** The sample size is too small, so increase the sample size.
-

Questions #45-46 of 82

Annual Returns on ABC Mutual Fund									
1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
11.0%	12.5%	8.0%	9.0%	13.0%	7.0%	15.0%	2.0%	-16.5%	11.0%

Question #45 of 82

Question ID: 438828

What is the arithmetic mean return for ABC Mutual Fund for the period 1991-2000?

Arithmetic
Mean

- A)** 11%
- B)** 7.2%
- C)** 8.2%
- D)** 28.2%

Question #46 of 82

Question ID: 438829

Assuming a mean of 7.2%, what is the sample standard deviation of the returns for ABC Mutual Fund for the period 1991-2000?

- A)** 10.2%.
- B)** 7.8%.

C) 9.1%.

D) 9.8%.

Question #47 of 82

Question ID: 438857

In the process of hypothesis testing, what is the proper order for these steps?

- A) State the hypotheses. Collect the sample and calculate the sample statistics. Make a decision.
Specify the level of significance.
 - B) Collect the sample and calculate the sample statistics. State the hypotheses. Specify the level of significance. Make a decision.
 - C) State the hypotheses. Specify the level of significance. Collect the sample and calculate the test statistics. Make a decision.
 - D) Specify the level of significance. State the hypotheses. Make a decision. Collect the sample and calculate the sample statistics.
-

Question #48 of 82

Question ID: 438879

Which of the following statements is FALSE?

- A) Failing to reject the null when it is false is an example of a Type II error.
 - B) If a person is presumed innocent unless proven otherwise, finding a guilty person innocent is an example of a Type I error.
 - C) The probability of committing a Type I error is the significance level of the test.
 - D) A Type I error is rejecting the null when it is actually true.
-

Question #49 of 82

Question ID: 438859

An analyst conducts a two-tailed z-test to determine if small cap returns are significantly different from 10%. The sample size was 200. The computed z-statistic is 2.3. Using a 5% level of significance, which statement is *most* accurate?

- A) A sample size of 200 indicates that we should fail to reject the null.
- B) You cannot determine what to do with the information given.
- C) Reject the null hypothesis and conclude that small cap returns are significantly different from 10%.
- D) Fail to reject the null hypothesis and conclude that small cap returns are close enough to 10% that we cannot say they are significantly different from 10%.

Question #50 of 82

Question ID: 438898

The test statistic for an F-test of the equality of two sample variances is the:

- A) product of the two sample variances.
 - B) ratio of the two sample variances.
 - C) ratio of the two sample standard deviations.
 - D) product of the two sample standard deviations.
-

Question #51 of 82

Question ID: 438826

For the investments shown in the table below, what are the mean, median, and mode of the returns?

Investment	Return (%)
A	12
B	14
C	9
D	13
E	7
F	8
G	12

Mean Median Mode

- A) 10.71% 12% 12%
 - B) 10.71% 9% 13%
 - C) 11.20% 12% 12%
 - D) 12.00% 12% 12%
-

Questions #52-53 of 82

Margo Hinsdale is testing the null hypothesis that the population mean is less than or equal to 45. A random sample of 81 observations selected from this population produced a mean of 46.3. The population has a standard deviation of 4.5.

Question #52 of 82

Question ID: 438890

The value of the *appropriate* test statistic for the test of the population mean is:

- A) $z = 2.60$.
- B) $z = -2.75$.
- C) $t = 4.60$.
- D) $t = 3.84$.

Question #53 of 82

Question ID: 438891

At a 1 percent level of significance, the correct decision is to:

- A) fail to reject the null hypothesis.
 - B) accept the null hypothesis.
 - C) neither reject nor fail to reject the null hypothesis.
 - D) reject the null hypothesis.
-

Question #54 of 82

Question ID: 438902

Abby Ness is an analyst for a firm that specializes in evaluating firms involved in mineral extraction. Ness believes that the earnings of copper extracting firms are more volatile than those of bauxite extraction firms. In order to test this, Ness examines the volatility of returns for 31 copper firms and 25 bauxite firms. The standard deviation of earnings for copper firms was \$2.69, while the standard deviation of earnings for bauxite firms was \$2.92. Ness's Null Hypothesis is $\sigma_1^2 = \sigma_2^2$. Based on the samples, can we reject the null hypothesis at a 95% confidence level using an F-statistic and why? Null is:

- A) not rejected. The critical value exceeds the F-value by 0.194.
 - B) not rejected. The critical value exceeds the F-value by 0.71.
 - C) rejected. The F-value exceeds the critical value by 0.71.
 - D) rejected. The F-value exceeds the critical value by 0.849.
-

Question #55 of 82

Question ID: 438874

If the sample size is greater than 30 and population variance is unknown, the appropriate test for the sample mean is the:

- A) t -test.
 - B) p -test or F -test.
 - C) t -test or z -test.
 - D) z -test.
-

Question #56 of 82

Question ID: 438878

Which of the following statements about hypothesis testing is *most* accurate?

- A) To test the claim that X is greater than zero, the null hypothesis would be $H_0: X > 0$.
 - B) The probability of a Type I error is equal to the significance level of the test.
 - C) The power of a test is one minus the probability of a Type I error.
 - D) If you can disprove the null hypothesis, then you have proven the alternative hypothesis.
-

Question #57 of 82

Question ID: 438865

Which of the following statements about hypothesis testing is *least* accurate?

- A) If the alternative hypothesis is $H_a: \mu > \mu_0$, a two-tailed test is appropriate.
 - B) A Type II error is failing to reject a false null hypothesis.
 - C) The null hypothesis is a statement about the value of a population parameter.
 - D) A Type I error is rejecting the null hypothesis when it is actually true.
-

Question #58 of 82

Question ID: 438870

Which of the following statements about testing a hypothesis using a Z-test is *least* accurate?

- A) A Type I error is rejecting the null hypothesis when it is actually true.
 - B) The calculated Z-statistic determines the appropriate significance level to use.
 - C) The confidence interval for a two-tailed test of a population mean at the 5% level of significance is that the sample mean falls between $\pm 1.96 \sigma/\sqrt{n}$ of the null hypothesis value.
 - D) If the calculated Z-statistic lies outside the critical Z-statistic range, the null hypothesis can be rejected.
-

Question #59 of 82

Question ID: 438876

The mean monthly return for an equity portfolio over 60 months is 1.5 percent. The standard deviation is 3.0 percent. The value of the test statistic to test the hypothesis that mean monthly return is equal to zero is *closest* to:

- A) 30.00.
 - B) 0.50.
 - C) 3.87.
 - D) 2.19.
-

Question #60 of 82

Question ID: 438844

What is the *appropriate* test statistic for constructing confidence intervals for the population mean of a normal distribution when the population variance is unknown?

- A) The z -statistic with $n - 1$ degrees of freedom.
 - B) The z -statistic at α with n degrees of freedom.
 - C) The t -statistic at $\alpha/2$ with n degrees of freedom.
 - D) The t -statistic at $\alpha/2$ with $n - 1$ degrees of freedom.
-

Question #61 of 82

Question ID: 438858

An analyst conducts a two-tailed test to determine if mean earnings estimates are significantly different from reported earnings. The sample size is greater than 25 and the computed test statistic is 1.25. Using a 5% significance level, which of the following statements is *most* accurate?

- A) To test the null hypothesis, the analyst must determine the exact sample size and calculate the degrees of freedom for the test.
 - B) The analyst should fail to reject the null hypothesis and conclude that the earnings estimates are not significantly different from reported earnings.
 - C) The appropriate test to apply is a two-tailed chi-square test.
 - D) The analyst should reject the null hypothesis and conclude that the earnings estimates are significantly different from reported earnings.
-

Question #62 of 82

Question ID: 438819

A sample covariance for the common stock of the Earth Company and the S&P 500 is -9.50 . Which of the following statements regarding the estimated covariance of the two variables is *most* accurate?

- A) The relationship between the two variables is not easily predicted by the calculated covariance.
 - B) The relationship between the two variables is highly predictable given the calculated covariance.
 - C) The two variables will have a slight tendency to move together.
 - D) The two variables will have a strong tendency to move in opposite directions.
-

Questions #63-67 of 82

Austin Roberts wants to test if the mean price of houses in the area is greater than \$145,000. A random sample of 36 houses in the area has a mean price of \$149,750. The population standard deviation is \$24,000, and Roberts wants to conduct

hypothesis testing at a 1 percent level of significance.

Question #63 of 82

Question ID: 438893

The appropriate alternative hypothesis is:

- A) $H_a: \mu \pm \$145,000$.
- B) $H_a: \mu < \$145,000$.
- C) $H_a: \mu \geq \$145,000$.
- D) $H_a: \mu > \$145,000$.

Question #64 of 82

Question ID: 438894

The value of the calculated test statistic is *closest* to:

- A) $z = 4.00$.
- B) $z = 0.67$.
- C) $z = 8.13$.
- D) $z = 1.19$.

Question #65 of 82

Question ID: 438895

Which of the following *most accurately* describes the appropriate test structure?

- A) F -test.
- B) Two-tailed test.
- C) One-tailed test.
- D) Chi-square test.

Question #66 of 82

Question ID: 438896

The critical value of the z -statistic is:

- A) $z = \pm 2.33$.
- B) $z = +2.33$.
- C) $z = -2.33$.
- D) $z = \pm 1.96$.

Question #67 of 82

Question ID: 438897

At a 1 percent level of significance, Roberts should:

- A) reject the null hypothesis.
- B) neither reject nor fail to reject the null hypothesis.
- C) accept the null hypothesis.

-
- D) fail to reject the null hypothesis.
-

Question #68 of 82

Question ID: 438831

The last three year-end returns for a stock are 5%, -2%, and 1%. Using an arithmetic mean, the sample standard deviation is closest to:

- A) 1.33%.
 - B) 2.87%.
 - C) 3.11%.
 - D) 3.51%.
-

Question #69 of 82

Question ID: 438882

Which of the following statements about hypothesis testing is *most* accurate?

- A) A hypothesized mean of 3, a sample mean of 6, and a standard error of the sampling means of 2 give a sample Z-statistic of 1.5.
 - B) When the critical Z-statistic is greater than the sample Z-statistic in a two-tailed test, reject the null hypothesis and accept the alternative hypothesis.
 - C) A two-tailed test on a large sample with a significance level of 0.01 has confidence intervals of ± 1.96 standard errors.
 - D) A Type I error is rejecting the null hypothesis when it is true, and a Type II error is accepting the alternative hypothesis when it is false.
-

Question #70 of 82

Question ID: 438877

A goal of an "innocent until proven guilty" justice system is to place a higher priority on:

- A) avoiding type III errors.
 - B) avoiding type II errors.
 - C) the null hypothesis.
 - D) avoiding type I errors.
-

Question #71 of 82

Question ID: 438903

The sampling distribution of variances is described by which distribution?

- A) F-distribution.
 - B) Student's t-distribution.
 - C) Normal distribution.
 - D) Chi-square distribution.
-

Question #72 of 82

Question ID: 438853

Robert Patterson, an options trader, believes that the return on options trading is higher on Mondays than on other days. In order to test his theory, he formulates a null hypothesis. Which of the following would be an appropriate null hypothesis?

Returns on Mondays are:

- A) less than returns on other days.
 - B) not greater than returns on other days.
 - C) not less than returns on other days.
 - D) greater than returns on other days.
-

Question #73 of 82

Question ID: 438843

A nursery sells trees of different types and heights. Suppose that 75 pine trees 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) $60 \pm 1.96(1.85)$.
 - B) $0.8 \pm 1.96(16)$.
 - C) $0.8 \pm 1.96(1.85)$.
 - D) $60 \pm 1.96(16)$.
-

Question #74 of 82

Question ID: 438869

If the null hypothesis is innocence, then the statement "It is better that the guilty go free, than the innocent are punished" is an example of preferring a:

- A) higher level of significance.
- B) type II error over a type I error.
- C) type I error over a type II error.

- D)** two tailed test over a one tailed test.

Questions #75-79 of 82

XYZ Corp. Annual Stock Prices					
1995	1996	1997	1998	1999	2000
22%	5%	-7%	11%	2%	11%

Question #75 of 82

Question ID: 438838

What is the mean return for XYZ stock?

- A)** 11.0%.
- B)** 7.3%.
- C)** 8.0%.
- D)** -7.0%.

Question #76 of 82

Question ID: 438839

Assuming that the distribution of XYZ stock returns is a population, what is the population variance (in %²)?

- A)** 5.0.
- B)** 7.7.
- C)** 6.8.
- D)** 80.2.

Question #77 of 82

Question ID: 438840

Assuming that the distribution of XYZ stock returns is a population, what is the population standard deviation?

- A)** 6.84%.
- B)** 46.22%.
- C)** 8.96%.
- D)** 5.02%.

Question #78 of 82

Question ID: 438841

Assuming that the distribution of XYZ stock returns is a sample, what is the sample variance (in %²)?

- A)** 96.3.
- B)** 7.4.

C) 72.4.

D) 5.0.

Question #79 of 82

Question ID: 438842

Assuming that the distribution of XYZ stock returns is a sample, what is the sample standard deviation?

A) 7.4%.

B) 96.3%.

C) 72.4%.

D) 9.8%.

Question #80 of 82

Question ID: 438833

A sample of paired points A and B is shown below. What is the covariance between the values of A and B?

Sample	A	B
1	1	2
2	4	5
3	9	7
4	11	10
5	14	12

A) 20.55.

B) 29.76.

C) 7.80.

D) 82.20.

Question #81 of 82

Question ID: 438901

You have collected monthly returns for a mutual fund and want to test the null hypothesis that the standard deviation exceeds the advertised standard deviation of 3.5 percent. The most appropriate test statistic is based on a:

- A)** z-test.
 - B)** F-test.
 - C)** t-test.
 - D)** chi-square test.
-

Question #82 of 82

Question ID: 438845

What is the *appropriate* test statistic for constructing confidence intervals for the population mean of a nonnormal distribution when the population variance is unknown and the sample size is large ($n \geq 30$)?

- A)** The *t*-statistic at $\alpha/2$ with n degrees of freedom.
- B)** The z-statistic or the *t*-statistic.
- C)** The z-statistic at α with n degrees of freedom.
- D)** The *t*-statistic at α with 29 degrees of freedom.

Topic 20: Linear Regression with One Regressor

Question #1 of 37

Question ID: 438930

The assumptions underlying linear regression include all of the following EXCEPT the:

- A) dependent variable and independent variable are linearly related.
 - B) independent variable is linearly related to the residuals (or disturbance term).
 - C) disturbance term is homoskedastic and is independently distributed.
 - D) disturbance term is normally distributed with an expected value of 0.
-

Question #2 of 37

Question ID: 424960

Which of the following is *least likely* an assumption of linear regression?

- A) The residuals are normally distributed.
 - B) The independent variable is correlated with the residuals.
 - C) The variance of the residuals is constant.
 - D) There is a linear relation between the dependent and independent variables.
-

Question #3 of 37

Question ID: 438934

A simple linear regression equation had a coefficient of determination (R^2) of 0.8. What is the correlation coefficient between the dependent and independent variables and what is the covariance between the two variables if the variance of the independent variable is 4 and the variance of the dependent variable is 9?

Correlation
coefficient Covariance

- A) 0.91 4.80
 - B) 0.89 5.34
 - C) 0.89 4.80
 - D) 0.91 5.34
-

Question #4 of 37

Question ID: 438910

In a regression analysis, the effects from independent variables that are not included in the model are embodied in the:

- A) scattergram.
 - B) error term.
 - C) slope coefficient.
 - D) intercept.
-

Question #5 of 37

Question ID: 438921

A simple linear regression is run to quantify the relationship between the return on the common stocks of medium sized companies (Mid Caps) and the return on the S&P 500 Index, using the monthly return on Mid Cap stocks as the dependent variable and the monthly return on the S&P 500 as the independent variable. The results of the regression are shown below:

	<i>Coefficient</i>	<i>Standard Error of Coefficient</i>	<i>t-Value</i>
Intercept	1.71	2.950	0.58
S&P 500	1.52	0.130	11.69
$R^2 = 0.599$			

Use the regression statistics presented above and assume this historical relationship still holds in the future period. If the expected return on the S&P 500 over the next period were 11%, the expected return on Mid Cap stocks over the next period would be:

- A) 33.8%.
 - B) 18.4%.
 - C) 20.3%.
 - D) 25.6%.
-

Question #6 of 37

Question ID: 438918

The independent variable in a regression equation is called all of the following EXCEPT:

- A) explanatory variable.
- B) exogenous variable.
- C) predicted variable.
- D) predicting variable.

Question #7 of 37

Question ID: 438927

Which of the following are included in a sample regression function?

- I. The intercept.
- II. The error term.
- III. The slope coefficient.
- IV. The independent variable.

- A)** III and IV only.
B) I, III, and IV only.
C) I, II, III, and IV.
D) I and III only.
-

Question #8 of 37

Question ID: 438924

Consider the regression results from the regression of Y against X for 50 observations:

$$Y = 5.0 - 1.5 X$$

The standard error of the estimate is 0.40 and the standard error of the coefficient is 0.45. The predicted value of Y if X is 10 is:

- A)** -10.
B) 20.
C) 10.
D) 4.5.
-

Question #9 of 37

Question ID: 438931

Linear regression is based on a number of assumptions. Which of the following is *least* likely an assumption of linear regression?

- A)** Values of the independent variable are not correlated with the error term.
B) The variance of the error terms each period remains the same.
C) A linear relationship exists between the dependent and independent variables.
D) There is at least some correlation between the error terms from one observation to the next.

Question #10 of 37

Question ID: 438935

Which term is *least likely* to apply to a regression model?

- A) Coefficient of determination.
- B) Coefficient of variation.
- C) R^2 .
- D) Goodness of fit.

Question #11 of 37

Question ID: 438937

What does the R^2 of a simple regression of two variables measure and what calculation is used to equate the correlation coefficient to the coefficient of determination?

R^2 measures: Correlation coefficient

- A) percent of variability of the dependent variable that is explained by the variability of the independent variable
 $R^2 = r^2$
- B) percent of variability of the independent variable that is explained by the variability of the dependent variable
 $R^2 = r^2$
- C) percent of variability of the dependent variable that is explained by the variability of the independent variable
 $R^2 = r \times 2$
- D) percent of variability of the independent variable that is explained by the variability of the dependent variable
 $R^2 = r \times 2$

Question #12 of 37

Question ID: 438941

Sample regression coefficients are often estimated with a process known as:

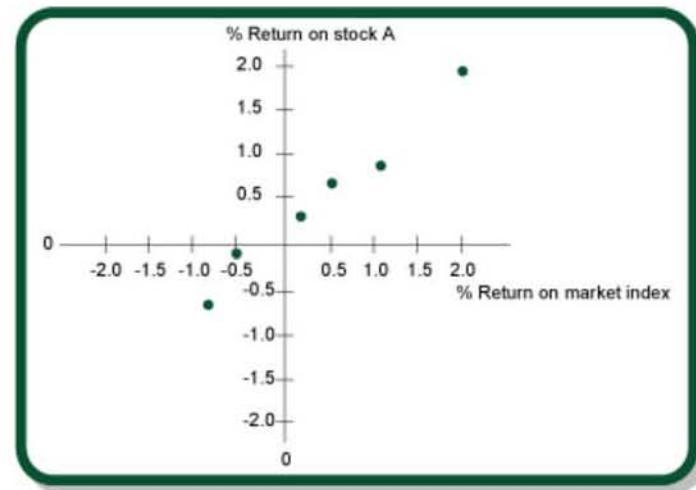
- A) a population regression function.

- B) a scattergram.
- C) Ockham's razor.
- D) ordinary least squares.

Question #13 of 37

Question ID: 438913

In the scatter plot below, the correlation between the return on stock A and the market index is:



- A) negative.
- B) zero.
- C) positive.
- D) not discernable using the scatter plot.

Question #14 of 37

Question ID: 438911

Which of the following statements regarding scatter plots is *most* accurate? Scatter plots:

- A) illustrate the relationship between two variables.
- B) are used to examine the fourth moment of a distribution (kurtosis).
- C) illustrate the scatterings of a single variable.
- D) are used to examine the third moment of a distribution (skewness).

Question #15 of 37

Question ID: 438917

A regression analysis has the goal of:

- A)** measuring the tendency of both independent and dependent variables to regress towards their respective means.
 - B)** measuring how the properties of the variables regress towards each other.
 - C)** estimating how changes in independent variables affect a dependent variable.
 - D)** estimating how changes in dependent variable affect an independent variable.
-

Question #16 of 37

Question ID: 438920

An analyst is examining the relationship between two random variables, RCRANTZ and GSTERN. He performs a linear regression that produces an estimate of the relationship:

$$\text{RCRANTZ} = 61.4 - 5.9\text{GSTERN}$$

Which interpretation of this regression equation is *least* accurate?

- A)** In this regression, RCRANTZ is the dependent variable and GSTERN is the independent variable.
 - B)** The covariance of RCRANTZ and GSTERN is negative.
 - C)** The intercept term implies that if GSTERN is zero, RCRANTZ is 61.4.
 - D)** If GSTERN increases by one unit, RCRANTZ should increase by 5.9 units.
-

Question #17 of 37

Question ID: 438915

The purpose of regression is to:

- A)** explain the variation in the independent variable.
 - B)** explain the mean of the independent variable.
 - C)** get the largest R^2 possible.
 - D)** explain the variation in the dependent variable.
-

Question #18 of 37

Question ID: 438928

Trudy Baker, FRM and Steven Phillips, FRM are planning to do a regression analysis. They discuss specifying the equation they wish to estimate. Baker proposes the specification $E(Y_i|X_i) = B_0 + (B_1) \times (X_i)^2$. Phillips proposes the specification $(Y_i|X_i) = B_0 + (B_1 \times X_i)^2$. Which, if either, is appropriate when applying linear regression?

- A)** Neither the specification of Baker nor that of Phillips.
- B)** The specification of Baker but not that of Phillips.

- C)** Both the specification of Baker and Phillips.
D) The specification of Phillips but not that of Baker.
-

Question #19 of 37

Question ID: 438926

In the estimated regression equation $Y = 0.78 - 1.5 X$, which of the following is least accurate when interpreting the slope coefficient?

- A)** If the value of X is zero, the value of Y will be -1.5.
B) -1.5 is the elasticity of Y with respect to X .
C) The dependent variable declines by -1.5 units if X increases by 1 unit.
D) The dependent variable increases by 1.5 units if X decreases by 1 unit.
-

Question #20 of 37

Question ID: 438912

If the correlation between two variables is -1.0, the scatter plot would appear along a:

- A)** straight line running from northwest to southeast.
B) a curved line centered in the scatter plot.
C) a curved line running from southwest to northeast.
D) straight line running from southwest to northeast.
-

Question #21 of 37

Question ID: 438939

A simple linear regression is run to quantify the relationship between the return on the common stocks of medium sized companies (Mid Caps) and the return on the S&P 500 Index, using the monthly return on Mid Cap stocks as the dependent variable and the monthly return on the S&P 500 as the independent variable. The results of the regression are shown below:

Coefficient	Standard Error		t-Value
		of coefficient	
Intercept	1.71	2.950	0.58
S&P 500	1.52	0.130	11.69
$R^2 = 0.599$			

The strength of the relationship, as measured by the correlation coefficient, between the return on Mid Cap stocks and the return on the S&P 500 for the period under study was:

- A)** 0.599.

- B) 0.130.
 - C) 0.774.
 - D) 2.950.
-

Question #22 of 37

Question ID: 438923

Paul Frank is an analyst for the retail industry. He is examining the role of television viewing by teenagers on the sales of accessory stores. He gathered data and estimated the following regression of sales (in millions of dollars) on the number of hours watched by teenagers (TV, in hours per week):

$$\text{Sales}_t = 1.05 + 1.6 \text{ TV}_t$$

The predicted sales if television watching is 5 hours per week is:

- A) \$9.05 million.
 - B) \$1.05 million.
 - C) \$2.65 million.
 - D) \$8.00 million.
-

Question #23 of 37

Question ID: 438940

Assume an analyst performs two simple regressions. The first regression analysis has an R-squared of 0.90 and a slope coefficient of 0.10. The second regression analysis has an R-squared of 0.70 and a slope coefficient of 0.25. Which one of the following statements is *most* accurate?

- A) Results of the second analysis are more reliable than the first analysis.
 - B) The influence on the dependent variable of a one unit increase in the independent variable is 0.7 in the first analysis and 0.9 in the second analysis.
 - C) The first regression has more explanatory power than the second regression.
 - D) The influence on the dependent variable of a one unit increase in the independent variable is 0.9 in the first analysis and 0.7 in the second analysis.
-

Question #24 of 37

Question ID: 438932

Assume you perform two simple regressions. The first regression analysis has an R-squared of 0.80 and a beta coefficient of 0.10. The second regression analysis has an R-squared of 0.80 and a beta coefficient of 0.25. Which one of the following statements is *most* accurate?

Results from the first analysis are more reliable than the second analysis.

- B) Results of the second analysis are more reliable than the first analysis.
 - C) Results from both analyses are equally reliable.
 - D) The influence on the dependent variable of a one-unit increase in the independent variable is the same in both analyses.
-

Question #25 of 37

Question ID: 438933

Which of the following statements regarding the coefficient of determination is *least* accurate? The coefficient of determination:

- A) may range from -1 to +1.
 - B) is the ratio of explained variation to total variation.
 - C) cannot decrease as independent variables are added to the model.
 - D) is the percentage of the total variation in the dependent variable that is explained by the independent variable.
-

Question #26 of 37

Question ID: 438916

The capital asset pricing model is given by: $R_i = R_f + \text{Beta} (R_m - R_f)$ where R_m = expected return on the market, R_f = risk-free market and R_i = expected return on a specific firm. The dependent variable in this model is:

- A) $R_m - R_f$.
 - B) R_i .
 - C) R_m .
 - D) R_f .
-

Question #27 of 37

Question ID: 424957

Which of the following is *least likely* an assumption of a simple regression?

- A) The expected value of the error term is zero.
 - B) The error term is normally distributed.
 - C) The variance of the error term is one.
 - D) There is a linear relationship between dependent and independent variables.
-

A)

Which of the following is *least likely* an assumption of linear regression analysis?

- A) The expected value of the residuals is zero.
 - B) The error term is normally distributed.
 - C) The Y values are all less than 3 standard deviations from the regression line.
 - D) The X values are uncorrelated with the error terms.
-

Question #29 of 37

Question ID: 438922

Given: $Y = 2.83 + 1.5X$

What is the predicted value of the dependent variable when the value of an independent variable equals 2?

- A) 6.50
 - B) -0.55
 - C) 5.83
 - D) 2.83
-

Question #30 of 37

Question ID: 424959

Which of the following is *least likely* an assumption of linear regression? The:

- A) residuals are mean reverting; that is, they tend towards zero over time.
 - B) variance of the residuals is constant.
 - C) residuals are independently distributed.
 - D) expected value of the residuals is zero.
-

Question #31 of 37

Question ID: 438938

An analyst performs two simple regressions. The first regression analysis has an R-squared of 0.40 and a beta coefficient of 1.2. The second regression analysis has an R-squared of 0.77 and a beta coefficient of 1.75. Which one of the following statements is *most* accurate?

- A) The second regression equation has more explaining power than the first regression equation.
- B) The R-squared of the first regression indicates that there is a 0.40 correlation between the independent and the dependent variables.
- C) The beta coefficient of the 2nd regression indicates that this regression has more explaining power than the first.

- D) The first regression equation has more explaining power than the second regression equation.
-

Question #32 of 37

Question ID: 438925

Sera Smith, a research analyst, had a hunch that there was a relationship between the percentage change in a firm's number of salespeople and the percentage change in the firm's sales during the following period. Smith ran a regression analysis on a sample of 50 firms, which resulted in a slope of 0.72, an intercept of +0.01, and an R^2 value of 0.65. Based on this analysis, if a firm made no changes in the number of sales people, what percentage change in the firm's sales during the following period does the regression model predict?

- A) +0.65%.
 - B) +1.00%.
 - C) +0.10%.
 - D) +0.72%.
-

Question #33 of 37

Question ID: 438929

Which of the following statements about linear regression analysis is *most* accurate?

- A) The coefficient of determination is defined as the strength of the linear relationship between two variables.
 - B) When there is a strong relationship between two variables we can conclude that a change in one will cause a change in the other.
 - C) A perfectly negative correlation can be depicted by a correlation coefficient of +1.
 - D) An assumption of linear regression is that the residuals are independently distributed.
-

Question #34 of 37

Question ID: 438936

Unlike the coefficient of determination, the coefficient of correlation:

- A) can have an absolute value greater than 1.
 - B) indicates the percentage of variation explained by a regression model.
 - C) measures the strength of association between the two variables more exactly.
 - D) indicates whether the slope of the regression line is positive or negative.
-

Question #35 of 37

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Question ID: 438919

Paul Frank is an analyst for the retail industry. He is examining the role of television viewing by teenagers on the sales of accessory stores. He gathered data and estimated the following regression of sales (in millions of dollars) on the number of hours watched by teenagers (in hours per week):

$$\text{Sales}_t = 1.05 + 1.6 \text{ TV}_t$$

Which of the following is the *most* accurate interpretation of the estimated results? If TV watching:

- A) goes up by one hour per week, sales of accessories increase by \$1.60.
- B) changes, no change in sales is expected.
- C) is zero (that is, every teenager turns off the TV for a week), the expected sales of accessories is \$0.
- D) goes up by one hour per week, sales of accessories increase by \$1.6 million.

Question #36 of 37

Question ID: 438914

Joe Harris is interested in why the returns on equity differ from one company to another. He chose several company-specific variables to explain the return on equity, including financial leverage and capital expenditures. In his model:

- A) return on equity is the independent variable, and financial leverage and capital expenditures are dependent variables.
- B) return on equity is the explanatory variable, and financial leverage and capital expenditure are the explained variables.
- C) return on equity is the dependent variable, and financial leverage and capital expenditures are independent variables.
- D) return on equity, financial leverage, and capital expenditures are all independent variables.

Question #37 of 37

Question ID: 438942

As part of a regression analysis, an analyst finds that: $Y - b_1 \times X = -1.8$ and $b_1 = 3.2$. Based upon these results, for every unit increase in the independent variable, on average the dependent variable increases by:

- A) 3.2.
- B) 5.0.
- C) 1.4.
- D) 1.8.

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Topic 21: Regression with a Single Regressor

Question #1 of 17

Question ID: 438953

An analyst has been assigned the task of evaluating revenue growth for an online education provider company that specializes in training adult students. She has gathered information about student ages, number of courses offered to all students each year, years of experience, annual income and type of college degrees, if any. A regression of annual dollar revenue on the number of courses offered each year yields the results shown below.

Coefficient Estimates		
Predictor	Coefficient	Standard Error of the Coefficient
Intercept	0.10	0.50
Slope (Number of Courses)	2.20	0.60

Which statement about the slope coefficient is *most correct*, assuming a 5 percent level of significance and 50 observations?

- A) t-Statistic: 0.20. Slope: Not significantly different from zero.
 - B) t-Statistic: 3.67. Slope: Significantly different from zero.
 - C) t-Statistic: 0.20. Slope: Significantly different from zero.
 - D) t-Statistic: 3.67. Slope: Not significantly different from zero.
-

Question #2 of 17

Question ID: 438948

Consider the regression results from the regression of Y against X for 50 observations:

$$Y = 0.78 - 1.5X$$

The standard error of the estimate is 0.40 and the standard error of the coefficient is 0.45.

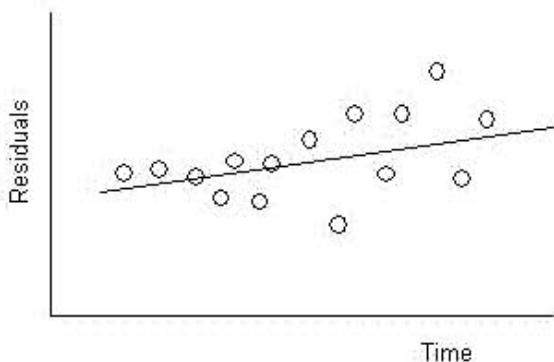
Which of the following reports the correct value of the *t*-statistic for the slope and correctly evaluates $H_0: b_1 \geq 0$ versus $H_a: b_1 < 0$ with 95 percent confidence?

- A) $t = -3.750$; slope is significantly different from zero.
 - B) $t = -3.333$; slope is significantly negative.
 - C) $t = 3.750$; slope is significantly different from zero.
 - D) $t = 3.333$; slope not significantly different from zero.
-

Question #3 of 17

Question ID: 438954

Consider the following graph of residuals and the regression line from a time-series regression:



These residuals exhibit the regression problem of:

- A)** homoskedasticity.
- B)** autocorrelation.
- C)** heteroskedasticity.
- D)** multicollinearity.

Questions #4-5 of 17

Assume you ran a multiple regression to gain a better understanding of the relationship between lumber sales, housing starts, and commercial construction. The regression uses lumber sales as the dependent variable with housing starts and commercial construction as the independent variables. The results of the regression are:

	<i>Coefficient</i>	<i>Standard Error</i>	<i>t-statistics</i>
Intercept	5.37	1.71	3.14
Housing starts	0.76	0.09	8.44
Commercial construction	1.25	0.33	3.78

The level of significance for a 95% confidence level is 1.96

Question #4 of 17

Question ID: 438951

Construct a 95% confidence interval for the slope coefficient for Housing Starts.

- A)** $0.76 \pm 1.96(8.44)$.

- B) $1.25 \pm 1.96(3.78)$.
- C) $1.25 \pm 1.96(0.33)$.
- D) $0.76 \pm 1.96(0.09)$.

Question #5 of 17

Question ID: 438952

Construct a 95% confidence interval for the slope coefficient for Commercial Construction.

- A) $1.25 \pm 1.96(0.33)$.
 - B) $0.76 \pm 1.96(8.44)$.
 - C) $0.76 \pm 1.96(0.09)$.
 - D) $1.25 \pm 1.96(3.78)$.
-

Question #6 of 17

Question ID: 438956

Which of the following conditions will *least likely* affect the statistical inference about regression parameters by itself?

- A) Serial correlation.
 - B) Unconditional heteroskedasticity.
 - C) Conditional heteroskedasticity.
 - D) Multicollinearity.
-

Question #7 of 17

Question ID: 438958

Which expression best represents the condition homoskedasticity? (In the expressions assume $\sigma^2 > 0$)

- A) $V(\varepsilon_i | X_i) = \sigma^2$.
 - B) $E(\varepsilon_i | X_i) = \sigma^2$.
 - C) $\text{corr}(\varepsilon_i, \varepsilon_{i+j}) = 0$.
 - D) $\text{corr}(X_i, \varepsilon_i) = 0$.
-

Question #8 of 17

Question ID: 438946

An analyst is regressing fund returns against the return on the Wilshire 5000 to determine whether beta is equal to 1.0. The analyst is trying to determine whether the number of observations should be increased. Which of the following is a reason why the test will have *higher* power if the number of observations is *increased*? The:

- A) mean squared error of the regression will be lower.

- B) constant of the regression will be closer to zero.
 - C) estimate of beta will be farther away from 1.0.
 - D) standard error of the regression will be lower.
-

Question #9 of 17

Question ID: 438959

If the variance of the residuals is not constant across all observations in the sample, the regression exhibits heteroskedasticity. Effects of heteroskedasticity include which of the following problems?

- I. The coefficient estimates in the regression model are affected.
 - II. If the standard errors are too small, but the coefficient estimates themselves are not affected, the t-statistics may be too large and the null hypothesis of no statistical significance will be rejected too often.
- A) Neither I nor II.
B) II only.
C) I only.
D) Both I and II.
-

Question #10 of 17

Question ID: 438957

Which of the following statements regarding heteroskedasticity is FALSE?

- A) The assumption of linear regression is that the residuals are heteroskedastic.
 - B) Conditional heteroskedasticity is the case in which the residuals are correlated with the values of the independent variables.
 - C) Heteroskedasticity may occur in cross-section or time-series analyses.
 - D) Heteroskedasticity results in an estimated variance that is too large and, therefore, affects statistical inference.
-

Question #11 of 17

Question ID: 438960

The Gauss-Markov theorem says that if the linear regression model assumptions are true and the regression errors display homoskedasticity, then the ordinary least squares (OLS) estimators exhibit which of the following properties?

- A) In repeated sampling, the averages of the coefficients from a sample will be distributed around the true population parameters.
 - B) The OLS estimate of the variance of the errors is biased.
 - C) The OLS estimated coefficients are based on non-linear functions.
 - D) The OLS estimated coefficients have the maximum variance compared to other methods of estimating the coefficients.
-

Question #12 of 17

Question ID: 438944

Consider the following estimated regression equation:

$$ROE_t = 0.23 - 1.50 CE_t$$

The standard error of the slope coefficient is 0.40 and the number of observations is 32. The 95 percent confidence interval for the slope coefficient, b_1 , is:

- A) $\{0.683 < b_1 < 2.317\}$.
 - B) $\{-2.300 < b_1 < -0.700\}$.
 - C) $\{-3.542 < b_1 < 0.542\}$.
 - D) $\{2.317 < b_1 < -0.683\}$.
-

Question #13 of 17

Question ID: 438947

Consider the regression results from the regression of Y against X for 50 observations:

$$Y = 0.78 + 1.2 X$$

The standard error of the estimate is 0.40 and the standard error of the coefficient is 0.45.

Which of the following reports the correct value of the t -statistic for the slope and correctly evaluates its statistical significance with 95 percent confidence?

- A) $t = 1.200$; slope not significantly different from zero.
 - B) $t = 1.789$; slope is not significantly different from zero.
 - C) $t = 3.000$; slope is significantly different from zero.
 - D) $t = 2.667$; slope is significantly different from zero.
-

Question #14 of 17

Question ID: 438949

Consider the following estimated regression equation:

$$\text{AUTO}_t = 0.89 + 1.32 \text{ PI}_t$$

The standard error of the coefficient is 0.42 and the number of observations is 22. The 95 percent confidence interval for the slope coefficient, b_1 , is:

- A) $\{0.444 < b_1 < 2.196\}$.
- B) $\{-0.766 < b_1 < 3.406\}$.
- C) $\{0.480 < b_1 < 2.160\}$.
- D) $\{0.900 < b_1 < 1.740\}$.

Question #15 of 17

Question ID: 438955

An analyst is estimating whether a fund's excess return for a quarter is related to interest rates and last quarter's excess return. The regression equation is found to have unconditional heteroskedasticity and serial correlation. Which of the following is *most* accurate? Parameter estimates will be:

- A) inaccurate and statistical inference about the parameters will not be valid.
- B) accurate and statistical inference about the parameters will be valid.
- C) inaccurate but statistical inference about the parameters will be valid.
- D) accurate but statistical inference about the parameters will not be valid.

Question #16 of 17

Question ID: 438943

The estimated slope coefficient from a single linear regression model is 0.55 with a standard error of 0.30. Assuming the sample for this model has 1,000 observations, what can we conclude about the 95% confidence interval for the model's slope coefficient?

- A) The null hypothesis that the slope coefficient is equal to zero should be accepted.
- B) The slope coefficient is not significantly different from zero.
- C) The slope coefficient is significantly different from zero.
- D) The null hypothesis that the slope coefficient is different than zero should be accepted.

Question #17 of 17

Question ID: 438945

A sample of 200 monthly observations is used to run a simple linear regression: $\text{Returns} = b_0 + b_1 \text{Leverage} + u$. The

t-value for the regression coefficient of leverage is calculated as $t = -1.09$. A 5 percent level of significance is used to test whether leverage has a significant influence on returns. The correct decision is to:

- A) do not reject the null hypothesis and conclude that leverage significantly explains returns.
- B) do not reject the null hypothesis and conclude that leverage does not significantly explain returns.
- C) reject the null hypothesis and conclude that leverage does not significantly explain returns.
- D) reject the null hypothesis and conclude that leverage significantly explains returns.

Topic 22: Linear Regression with Multiple Regressors

Question #1 of 10

Question ID: 438969

An analyst runs a regression of portfolio returns on three independent variables. These independent variables are price-to-sales (P/S), price-to-cash flow (P/CF), and price-to-book (P/B). The analyst discovers that the p-values for each independent variable are relatively high. However, the F-test has a very small p-value. The analyst is puzzled and tries to figure out how the F-test can be statistically significant when the individual independent variables are not significant. What violation of regression analysis has occurred?

- A) serial correlation.
 - B) multicollinearity.
 - C) unconditional heteroskedasticity.
 - D) conditional heteroskedasticity.
-

Question #2 of 10

Question ID: 438961

Which of the following statements regarding the results of a regression analysis is **FALSE**? The:

- A) intercept is the value that the dependent variable takes on if all the independent variables had a value of zero.
 - B) slope coefficient in a multiple regression is the value of the dependent variable for a given value of the independent variable.
 - C) slope coefficients in the multiple regression are referred to as partial betas.
 - D) slope coefficient in a multiple regression is the change in the dependent variable for a one-unit change in the independent variable, holding all other variables constant.
-

Question #3 of 10

Question ID: 438970

An analyst further studies the independent variables of a study she recently completed. The correlation matrix shown below is the result. Which statement *best* reflects possible problems with a multivariate regression?

	<i>Age</i>	<i>Education</i>	<i>Experience</i>	<i>Income</i>
<i>Age</i>	1.00			
<i>Education</i>	0.50	1.00		
<i>Experience</i>	0.95	0.55	1.00	
<i>Income</i>	0.60	0.65	0.89	1.00

- A) Income is not needed.
- B) Age should be excluded from the regression.
- C) Experience may be a redundant variable.
- D) Education may be unnecessary.

Question #4 of 10

Question ID: 438962

When interpreting the results of a multiple regression analysis, which of the following terms represents the value of the dependent variable when the independent variables are all equal to zero?

- A) Slope coefficient.
- B) Intercept term.
- C) *p*-value.
- D) *t*-value.

Question #5 of 10

Question ID: 438964

Assume that in a particular multiple regression model, it is determined that the error terms are uncorrelated with each other. Which of the following statements is *most* accurate?

- A) Serial correlation may be present in this multiple regression model, and can be confirmed only through a Durbin-Watson test.
- B) Multicollinearity exists in this multiple regression model, and can be corrected through the addition of a correlated variable.
- C) This model is in accordance with the basic assumptions of multiple regression analysis because the errors are not serially correlated.

- D)** Unconditional heteroskedasticity present in this model should not pose a problem, but can be corrected by using robust standard errors.
-

Question #6 of 10

Question ID: 438967

Which of the following statements regarding multicollinearity is **FALSE**?

- A)** Multicollinearity makes it difficult to determine the contribution to explanation of the dependent variable of an individual explanatory variable.
 - B)** Multicollinearity may be a problem even if the multicollinearity is not perfect.
 - C)** Multicollinearity may be present in any regression model.
 - D)** If the *t*-statistics for the individual independent variables are insignificant, yet the F-statistic is significant, this indicates the presence of multicollinearity.
-

Question #7 of 10

Question ID: 438966

Which of the following is a potential remedy for multicollinearity?

- A)** Take first differences of the dependent variable.
 - B)** Increase the sample size.
 - C)** Add dummy variables to the regression.
 - D)** Omit one or more of the collinear variables.
-

Question #8 of 10

Question ID: 438968

A variable is regressed against three other variables, x, y, and z. Which of the following would NOT be an indication of multicollinearity? X is closely related to:

- A)** y^2 .
 - B)** 3.
 - C)** 9y, and x is closely related to 4z.
 - D)** 3y + 2z.
-

Question #9 of 10

Question ID: 438965

Which of the following statements *least* accurately describes one of the fundamental multiple regression assumptions?

- A)** The variance of the error terms is not constant (i.e., the errors are heteroskedastic).
 - B)** There is no exact linear relationship between any two or more independent variables.
 - C)** The error term is normally distributed.
 - D)** The independent variables are not random.
-

Question #10 of 10

Question ID: 438963

One of the underlying assumptions of a multiple regression is that the variance of the residuals is constant for various levels of the independent variables. This quality is referred to as:

- A)** homoskedasticity.
- B)** a normal distribution.
- C)** a linear relationship.
- D)** serial correlation.

Topic 23: Hypothesis Tests and Confidence Intervals in Multiple Regression

Question #1 of 20

Question ID: 438992

A dependent variable is regressed against three independent variables across 25 observations. The regression sum of squares is 119.25, and the total sum of squares is 294.45. The following are the estimated coefficient values and standard errors of the coefficients.

Coefficient	Value	Standard error
1	2.43	1.4200
2	3.21	1.5500
3	0.18	0.0818

What is the p-value for the test of the hypothesis that all three of the coefficients are equal to zero?

- A)** Between 0.05 and 0.10.
- B)** Between 0.025 and 0.05.
- C)** lower than 0.025.
- D)** Greater than 0.10.

Question #2 of 20

Question ID: 438972

63 monthly stock returns for a fund between 1997 and 2002 are regressed against the market return, measured by the Wilshire 5000, and two dummy variables. The fund changed managers on January 2, 2000. Dummy variable one is equal to 1 if the return is from a month between 2000 and 2002. Dummy variable number two is equal to 1 if the return is from the second half of the year. There are 36 observations when dummy variable one equals 0, half of which are when dummy variable two also equals 0. The following are the estimated coefficient values and standard errors of the coefficients.

Coefficient	Value	Standard error
Market	1.43000	0.319000
Dummy 1	0.00162	0.000675
Dummy 2	0.00132	0.000733

What is the p-value for a test of the hypothesis that performance in the second half of the year is different than performance in the first half of the year?

- A)** Greater than 0.10.
 - B)** Lower than 0.01.
 - C)** Between 0.05 and 0.10.
 - D)** Between 0.01 and 0.05.
-

Question #3 of 20

Question ID: 438994

When utilizing a proxy for one or more independent variables in a multiple regression model, which of the following errors is *most likely* to occur?

- A)** Serial correlation.
 - B)** Model misspecification.
 - C)** Multicollinearity.
 - D)** Heteroskedasticity.
-

Questions #4-5 of 20

You have been asked to forecast the level of operating profit for a proposed new branch of a tire store. This forecast is one component in forecasting operating profit for the entire company for the next fiscal year. You decide to conduct multiple regression analysis using "branch store operating profit" as the dependent variable and three independent variables. The three independent variables are "population within 5 miles of the branch," "operating hours per week," and "square footage of the facility." You used data on the company's existing 23 branches to develop the model (n=23).

Regression of Operating Profit on Population, Operating Hours, and Square

Footage

<i>Dependent Variable</i>	<i>Operating Profit (Y)</i>	
<i>Independent Variables</i>	<i>Coefficient Estimate</i>	<i>t-value</i>
Intercept	103,886	2.740
Population within 5 miles (X_1)	4.372	2.133
Operating hours per week (X_2)	214.856	0.258
Square footage of facility (X_3)	56.767	2.643
R ²	0.983	
Adjusted R ²	0.980	
F-Statistic	360.404	
Standard error of the model	19,181	

	Correlation Matrix			
	Y	X ₁	X ₂	X ₃
Y	1.00			
X ₁	0.99	1.00		
X ₂	0.69	0.67	1.00	
X ₃	0.99	0.99	.71	1.00

Degrees of Freedom	.20	.10	.05	.02	.01
3	1.638	2.353	3.182	4.541	5.841
19	1.328	1.729	2.093	2.539	2.861
23	1.319	1.714	2.069	2.50	2.807

Question #4 of 20

Question ID: 438978

You want to evaluate the statistical significance of the slope coefficient of an independent variable used in this regression model. For 95 percent confidence, you should compare the *t*-statistic to the critical value from a *t*-table using:

- A) 24 degrees of freedom and 0.05 level of significance for a two-tailed test.
- B) 24 degrees of freedom and 0.05 level of significance for a one-tailed test.
- C) 19 degrees of freedom and 0.05 level of significance for a one-tailed test.
- D) 19 degrees of freedom and 0.05 level of significance for a two-tailed test.

Question #5 of 20

Question ID: 438979

The probability of finding a value of *t* for variable X₁ that is as large or larger than |2.133| when the null hypothesis is true is:

- A) between 5% and 10%.
- B) between 2% and 5%.
- C) between 10% and 20%.
- D) between 1% and 2%.

Question #6 of 20

Question ID: 438973

Seventy-two monthly stock returns for a fund between 1997 and 2002 are regressed against the market return, measured by the Wilshire 5000, and two dummy variables. The fund changed managers on January 2, 2000. Dummy variable one is equal to 1 if the return is from a month between 2000 and 2002. Dummy variable number two is equal to 1 if the return is from the second half of the year. There are 36 observations when dummy variable one equals 0, half of which are when dummy variable two also equals 0. The following are the estimated coefficient values and standard errors of the coefficients.

<i>Coefficient</i>	<i>Value</i>	<i>Standard error</i>
Market	1.43000	0.319000
Dummy 1	0.00162	0.000675
Dummy 2	-0.00132	0.000733

What is the *p*-value for a test of the hypothesis that the new manager outperformed the old manager?

- A)** Between 0.05 and 0.10.
 - B)** Between 0.01 and 0.05.
 - C)** Greater than 0.10.
 - D)** Lower than 0.01.
-

Question #7 of 20

Question ID: 438976

A dependent variable is regressed against three independent variables across 25 observations. The regression sum of squares is 119.25, and the total sum of squares is 294.45. The following are the estimated coefficient values and standard errors of the coefficients.

<i>Coefficient</i>	<i>Value</i>	<i>Standard error</i>
1	2.43	1.4200
2	3.21	1.5500
3	0.18	0.0818

For which of the coefficients can the hypothesis that they are equal to zero be rejected at the 0.05 level of significance?

- A)** 3 only.
 - B)** 2 and 3 only.
 - C)** 1 and 2 only.
 - D)** 1, 2, and 3.
-

Question #8 of 20

Question ID: 438971

Consider the following estimated regression equation, with standard errors of the coefficients as indicated:

$$\text{Sales}_i = 10.0 + 1.25 \text{ R\&D}_i + 1.0 \text{ ADV}_i - 2.0 \text{ COMP}_i + 8.0 \text{ CAP}_i$$

where the standard error for R&D is 0.45, the standard error for ADV is 2.2, the standard error for COMP 0.63, and the

standard error for CAP is 2.5.

The equation was estimated over 40 companies. Using a 5 percent level of significance, what are the hypotheses and the calculated test statistic to test whether the slope on R&D is different from 1.0?

- A) $H_0: b_{R&D} = 1$ versus $H_a: b_{R&D} \neq 1$; $t = 2.778$.
- B) $H_0: b_{R&D} \neq 1$ versus $H_a: b_{R&D} = 1$; $t = 0.556$.
- C) $H_0: b_{R&D} = 1$ versus $H_a: b_{R&D} \neq 1$; $t = 0.556$.
- D) $H_0: b_{R&D} \neq 1$ versus $H_a: b_{R&D} = 1$; $t = 2.778$.

Question #9 of 20

Question ID: 438974

David Black wants to test whether the estimated beta in a market model is equal to one. He collected a sample of 60 monthly returns on a stock and estimated the regression of the stock's returns against those of the market. The estimated beta was 1.1, and the standard error of the coefficient is equal to 0.4. What should Black conclude regarding the beta if he uses a 5% level of significance? The null hypothesis that beta is:

- A) equal to one cannot be rejected.
- B) not equal to one cannot be rejected.
- C) equal to one is rejected.
- D) equal to one cannot be rejected or accepted.

Question #10 of 20

Question ID: 438975

Seventy-two monthly stock returns for a fund between 1997 and 2002 are regressed against the market return, measured by the Wilshire 5000, and two dummy variables. The fund changed managers on January 2, 2000. Dummy variable one is equal to 1 if the return is from a month between 2000 and 2002. Dummy variable number two is equal to 1 if the return is from the second half of the year. There are 36 observations when dummy variable one equals 0, half of which are when dummy variable two also equals zero. The following are the estimated coefficient values and standard errors of the coefficients.

Coefficient	Value	Standard error
Market	1.43000	0.319000
Dummy 1	0.00162	0.000675

Dummy 2	-0.00132	0.000733
---------	----------	----------

What is the p-value for a test of the hypothesis that the beta of the fund is greater than 1?

- A)** Greater than 0.10.
 - B)** Between 0.05 and 0.10.
 - C)** Between 0.01 and 0.05.
 - D)** Lower than 0.01.
-

Question #11 of 20

Question ID: 438993

Consider the following analysis of variance (ANOVA) table:

Source	Sum of squares	Degrees of freedom	Mean square
Regression	20	1	20
Error	80	40	2
Total	100	41	

The F-statistic for the test of the fit of the model is *closest* to:

- A)** 0.10.
 - B)** 0.25.
 - C)** 0.20.
 - D)** 10.00.
-

Questions #12-13 of 20

In a recent analysis of salaries (in \$1,000) of financial analysts, a regression of salaries on education, experience, and gender is run. Gender equals one for men and zero for women. The regression results from a sample of 230 financial analysts are presented below, with t-statistics in parenthesis.

$$\text{Salaries} = 34.98 + 1.2 \text{ Education} + 0.5 \text{ Experience} + 6.3 \text{ Gender}$$

(29.11) (8.93) (2.98) (1.58)

Question #12 of 20

Question ID: 438982

What is the expected salary (in \$1,000) of a woman with 16 years of education and 10 years of experience?

- A)** 61.28.
- B)** 59.18.
- C)** 54.98.
- D)** 65.48.

Question #13 of 20

Question ID: 438983

Holding everything else constant, do men get paid more than women? Use a 5% level of significance. No, since the *t*-value:

- A)** does not exceed the critical value of 1.65.
- B)** does not exceed the critical value of 1.96.
- C)** exceeds the critical value of 1.96.
- D)** exceeds the critical value of 1.65.

Questions #14-19 of 20

Autumn Voiku is attempting to forecast sales for Brookfield Farms based on a multiple regression model. Voiku has constructed the following model:

$$\text{sales} = b_0 + (b_1 \times \text{CPI}) + (b_2 \times \text{IP}) + (b_3 \times \text{GDP}) + \varepsilon_t$$

Where:

sales = \$ change in sales (in 000's)

CPI = change in the consumer price index

IP = change in industrial production (millions)

GDP = change in GDP (millions)

All changes in variables are in percentage terms.

Voiku uses monthly data from the previous 180 months of sales data and for the independent variables. The model estimates (with coefficient standard errors in parentheses) are:

$$\text{sales} = 10.2 + (4.6 \times \text{CPI}) + (5.2 \times \text{IP}) + (11.7 \times \text{GDP})$$

(5.4) (3.5) (5.9) (6.8)

The sum of squared errors is 140.3 and the total sum of squares is 368.7.

Voiku calculates the unadjusted R^2 , the adjusted R^2 , and the standard error of estimate to be 0.592, 0.597, and 0.910, respectively.

Voiku is concerned that one or more of the assumptions underlying multiple regression has been violated in her analysis. In a conversation with Dave Grimbles, CFA, a colleague who is considered by many in the firm to be a quant specialist. Voiku says, "It is my understanding that there are five assumptions of a multiple regression model!"

- Assumption 1: There is a linear relationship between the dependent and independent variables.
- Assumption 2: The independent variables are not random, and there is no correlation between any two of the independent variables.
- Assumption 3: The residual term is normally distributed with an expected value of zero.
- Assumption 4: The residuals are serially correlated.
- Assumption 5: The variance of the residuals is constant.

Grimbles agrees with Miller's assessment of the assumptions of multiple regression.

Voiku tests and fails to reject each of the following four null hypotheses at the 99% confidence interval:

- Hypothesis 1: The coefficient on GDP is negative.
- Hypothesis 2: The intercept term is equal to -4.
- Hypothesis 3: A 2.6% increase in the CPI will result in an increase in sales of more than 12.0%.
- Hypothesis 4: A 1% increase in industrial production will result in a 1% decrease in sales.

Figure 1: Partial table of the Student's t-distribution (One-tailed probabilities)

<i>df</i>	<i>p = 0.10</i>	<i>p = 0.05</i>	<i>p = 0.025</i>	<i>p = 0.01</i>	<i>p = 0.005</i>
170	1.287	1.654	1.974	2.348	2.605
176	1.286	1.654	1.974	2.348	2.604
180	1.286	1.653	1.973	2.347	2.603

Figure 2: Partial F-Table critical values for right-hand tail area equal to 0.05

	<i>df1 = 1</i>	<i>df1 = 3</i>	<i>df1 = 5</i>
<i>df2 = 170</i>	3.90	2.66	2.27
<i>df2 = 176</i>	3.89	2.66	2.27
<i>df2 = 180</i>	3.89	2.65	2.26

Figure 3: Partial F-Table critical values for right-hand tail area equal to 0.025

	<i>df1 = 1</i>	<i>df1 = 3</i>	<i>df1 = 5</i>
<i>df2 = 170</i>	5.11	3.19	2.64
<i>df2 = 176</i>	5.11	3.19	2.64
<i>df2 = 180</i>	5.11	3.19	2.64

Question #14 of 20

Question ID: 438986

Concerning the assumptions of multiple regression, Grimbles is:

- A) incorrect to agree with Voiku's list of assumptions because two of the assumptions are stated incorrectly.
- B) correct to agree with Voiku's statement of the assumptions.

- C) incorrect to agree with Voiku's list of assumptions because three of the assumptions are stated incorrectly.
- D) incorrect to agree with Voiku's list of assumptions because one of the assumptions is stated incorrectly.

Question #15 of 20

Question ID: 599862

For which of the four hypotheses did Voiku incorrectly fail to reject the null, based on the data given in the problem?

- A) Hypothesis 1.
- B) Hypothesis 4.
- C) Hypothesis 2.
- D) Hypothesis 3.

Question #16 of 20

Question ID: 438988

The *most* appropriate decision with regard to the F-statistic for testing the null hypothesis that all of the independent variables are simultaneously equal to zero at the 5 percent significance level is to:

- A) fail to reject the null hypothesis because the F-statistic is smaller than the critical F-value of 2.66.
- B) fail to reject the null hypothesis because the F-statistic is smaller than the critical F-value of 3.19.
- C) reject the null hypothesis because the F-statistic is larger than the critical F-value of 2.66.
- D) reject the null hypothesis because the F-statistic is larger than the critical F-value of 3.19.

Question #17 of 20

Question ID: 438989

Regarding Voiku's calculations of R^2 and the standard error of estimate, she is:

- A) correct in her calculation of the unadjusted R^2 but incorrect in her calculation of the standard error of estimate.
- B) incorrect in her calculation of the unadjusted R^2 but correct in her calculation of the standard error of estimate.
- C) correct in her calculation of both the unadjusted R^2 and the standard error of estimate.
- D) incorrect in her calculation of both the unadjusted R^2 and the standard error of estimate.

Question #18 of 20

Question ID: 459978

The multiple regression, as specified, *most likely* suffers from:

- A) serial correlation of the error terms.
- B) heteroskedasticity.
- C) omitted variables.

- D)** multicollinearity.

Question #19 of 20

Question ID: 438991

A 90 percent confidence interval for the coefficient on GDP is:

- A)** 0.5 to 22.9.
 - B)** -1.9 to 19.6.
 - C)** -4.4 to 20.8.
 - D)** -1.5 to 20.0.
-

Question #20 of 20

Question ID: 438980

An analyst is investigating the hypothesis that the beta of a fund is equal to one. The analyst takes 60 monthly returns for the fund and regresses them against the Wilshire 5000. The test statistic is 1.97 and the *p*-value is 0.05. Which of the following is **CORRECT**?

- A)** The proportion of occurrences when the absolute value of the test statistic will be higher when beta is equal to 1 than when beta is not equal to 1 is less than or equal to 5%.
- B)** If beta is equal to 1, the likelihood that the absolute value of the test statistic is equal to 1.97 is less than or equal to 5%.
- C)** If beta is equal to 1, the likelihood that the absolute value of the test statistic would be greater than or equal to 1.97 is 5%.
- D)** For a sample of 100 beta values, the expected number of times beta would be equal to 1 is less than or equal to 5%.

Topic 24: Modeling and Forecasting Trend

Question #1 of 5

Question ID: 507544

Regarding the bias associated with the mean squared error (MSE) measure, which of the following statements is correct?

- A) MSE will have an upward bias when predicting out-of-sample error variance.
 - B) The use of in-sample MSE to estimate out-of-sample MSE is very effective because in-sample MSE cannot increase when more variables are included in the forecasting model.
 - C) The unbiased MSE estimate will rank models differently than the adjusted R² measure.
 - D) One way to reduce the bias associated with MSE is to impose a penalty on the degrees of freedom.
-

Question #2 of 5

Question ID: 496388

Assume that a sample of 100 observations has a sum of squared residuals (SSR) of 350 and an explained sum of squares of 500. What is the mean squared error (MSE)?

- A) 1.5.
 - B) 3.5.
 - C) 0.20.
 - D) 5.0.
-

Question #3 of 5

Question ID: 496392

Regarding the conditions for model selection criteria to demonstrate consistency, which of the following statements is true?

- I. The most consistent selection criteria with the greatest penalty factor for degrees of freedom is unbiased mean squared error.
- II. If we consider the fact that the true model may be much more complicated than the models under consideration, then the Akaike information criterion (AIC) measure should be examined.

- A) II only.
- B) I only.
- C) Both I and II.
- D) Neither I nor II.

Question #4 of 5

Question ID: 496390

Assume that a sample of 500 observations has degrees of freedom of 25. What is the penalty factor associated with the Schwarz information criterion (SIC)?

- A) 1.053.
 - B) 1.284.
 - C) 1.105.
 - D) 1.364.
-

Question #5 of 5

Question ID: 496391

When applying model selection criteria, which of the following metrics have the lowest penalty factor as the degrees of freedom to total sample size increases?

- A) Information ratio criterion.
- B) Akaike information criterion.
- C) Schwarz information criterion.
- D) Unbiased mean squared error.

Topic 25: Modeling and Forecasting Seasonality

Question #1 of 5

Question ID: 726925

Which of the following sources would an analyst modeling sales of Christmas trees most likely incorporate into a forecasting model that uses dummy variables?

- A) trading-day variation.
 - B) stochastic seasonality.
 - C) deterministic seasonality.
 - D) seasonal adjustments.
-

Question #2 of 5

Question ID: 726924

If a forecaster is using a time series model and notices periodic spikes in autocorrelations as they gradually decay, this is most likely a sign of:

- A) seasonality in the data.
 - B) a structural shift in the time series.
 - C) conditional heteroskedasticity.
 - D) a linear trend in the data set.
-

Question #3 of 5

Question ID: 726928

A fund has had three different managers during the past 10 years. An analyst wants to measure whether any of these changes in managers has had an impact on performance. The analyst also wants to simultaneously measure the impact of risk on the fund's return. Assume R is the return on the fund, and M is the return on a market index. Which of the following regression equations can appropriately measure the desired impacts?

- A)** $R = a + bM + c_1D_1 + c_2D_2 + c_3D_3 + \varepsilon$, where $D_1 = 1$ if the return is from the first manager, and $D_2 = 1$ if the return is from the second manager, and $D_3 = 1$ is the return is from the third manager.
- B)** $R = a + bM + c_1D_1 + c_2D_2 + \varepsilon$, where $D_1 = 1$ if the return is from the first manager, and $D_2 = 1$ if the return is from the third manager.
- C)** The desired impact cannot be measured.
- D)** $R = a + bM + cD + \varepsilon$, where $D = 1$ if the return is from the first manager, 2 if the return is from the second manager, and 3 if the return is from the third manager.

Question #4 of 5

Question ID: 726926

Consider the following model of earnings (EPS) regressed against dummy variables for the quarters:

$$EPS_t = \beta_0 + \beta_1 Q_{1,t} + \beta_2 Q_{2,t} + \beta_3 Q_{3,t}$$

where:

EPS_t is a quarterly observation of earnings per share

$D_{1,t}$ takes on a value of 1 if period t is the second quarter, 0 otherwise

$D_{2,t}$ takes on a value of 1 if period t is the third quarter, 0 otherwise

$D_{3,t}$ takes on a value of 1 if period t is the fourth quarter, 0 otherwise

Which of the following statements regarding this model is most accurate? The:

- A)** significance of the coefficients cannot be interpreted in the case of dummy variables.
- B)** coefficient on each dummy variable tells us about the difference in earnings per share between the respective quarter and the one left out (first quarter in this case).
- C)** EPS for the first quarter is represented by the residual.
- D)** change in EPS for the fourth quarter is estimated to be $\beta_1 + \beta_2 + \beta_3$.

Question #5 of 5

Question ID: 726927

An analyst is trying to determine whether fund return performance is persistent. The analyst divides funds into three groups based on whether their return performance was in the top third (group 1), middle third (group 2), or bottom third (group 3) during the previous year. The manager then creates the following equation: $R = b_0 + b_1 D_1 + b_2 D_2 + b_3 D_3 + \varepsilon$, where R is return premium on the fund (the return minus the return on the S&P 500 benchmark) and D_i is equal to 1 if the fund is in group i . Assuming no other information, this equation will suffer from:

- A)** non-normality.
- B)** multicollinearity.

- C)** serial correlation.
- D)** heteroskedasticity.

Topic 26: Characterizing Cycles

Question #1 of 6

Question ID: 444883

A high Q-statistic describes a fund with:

- A)** large positive autocorrelation, only.
 - B)** no autocorrelation.
 - C)** large negative autocorrelation, only.
 - D)** large positive autocorrelation or large negative autocorrelation.
-

Question #2 of 6

Question ID: 496393

Which of the following terms is most likely associated with the degree of correlation and interdependency between data points in a time series?

- A)** Autoregression.
 - B)** Autocovariance function.
 - C)** Autocorrelation function.
 - D)** Covariance stationary.
-

Question #3 of 6

Question ID: 496394

All of the following statements represent conditions for a time series to be covariance stationary except:

- A)** the standard deviation of the time series is infinite, but constant over time.
 - B)** the expected value of the time series is constant over time.
 - C)** the covariance of the time series with leading or lagged values of itself is constant.
 - D)** the time series volatility around its mean does not change over time.
-

Question #4 of 6

Question ID: 496396

In the context of Wold's representation theorem, what is the common terminology used to represent the one-step-ahead forecasted error terms?

- A)** Rational Polynomials.

B) Rational distributed lags.

C) Innovations.

D) Information sets.

Question #5 of 6

Question ID: 496397

Zack Snyder is comparing and contrasting the Box-Pierce Q-statistic with the Ljung-Box Q-statistic. Which of the following statements should he identify as being incorrect regarding these Q-statistics?

- I. The Box-Pierce Q-statistic reflects the absolute magnitudes of the correlations, because it sums the squared autocorrelations.
- II. For large sample sizes, weights for both the Box-Pierce Q-statistic and the Ljung-Box Q-statistic are roughly equal.

A) Both I and II.

B) II only.

C) Neither I nor II.

D) I only.

Question #6 of 6

Question ID: 496395

Regarding a white noise process, which of the following characteristics should not be included in the dynamic structure of white noise?

A) The unconditional mean and variance must be constant for any covariance stationary process.

B) Events in a white noise process exhibit no correlation between the past and present.

C) The process must be serially independent and normally distributed.

D) Both conditional and unconditional means and variances are the same for an independent white noise process.

Topic 27: Modeling Cycles: MA, AR, and ARMA Models

Question #1 of 5

Question ID: 496399

When examining the properties of a general finite-order process of order q [MA(q)], which of the following statements is correct when comparing the MA(q) process to the MA(1) process?

- I. Both the MA(1) and MA(q) processes exhibits autocorrelation cutoff after the first lagged error term.
- II. The MA(q) process is a subset of the first-order moving average [MA(1)].

- A)** I only.
 - B)** II only.
 - C)** Neither I nor II.
 - D)** Both I and II.
-

Question #2 of 5

Question ID: 496401

If an analyst notices that autocorrelations decay gradually over time, which time series process should the analyst most likely rule out when attempting to forecast data?

- A)** Autoregressive moving average (ARMA) process.
 - B)** General p th order autoregressive [AR(p)] process.
 - C)** Moving average [MA(1)] process.
 - D)** First-order autoregressive [AR(1)] process.
-

Question #3 of 5

Question ID: 496400

Assume in an autoregressive [AR(1)] process that the coefficient for the lagged observation of the variable being estimated is equal to 0.75. According to the Yule-Walker equation, what should be the second-period autocorrelation?

- A)** 0.5625.
 - B)** 0.75.
 - C)** 0.866.
 - D)** 0.375.
-

Question #4 of 5

Question ID: 496402

If a forecaster is using a time series model and notices periodic spikes in autocorrelations as they gradually decay, this is most likely a sign of:

- A) first differencing lag operators.
 - B) a structural shift in the time series.
 - C) seasonality in the data.
 - D) autoregressive conditional heteroskedasticity (ARCH).
-

Question #5 of 5

Question ID: 496398

Regarding the properties of a first-order moving average [MA(1)] process, which of the following statements is most likely correct?

- A) For any value beyond the first lagged error term, the autocorrelation will be one in an MA(1) process.
- B) The MA(1) process has a mean of zero and a dynamic variance.
- C) The MA(1) process is considered to be first-order because it only has one lagged error term.
- D) An MA(1) process is a nonlinear regression of the current values of a time series against the previous unobserved error terms.

Topic 28: Volatility

Question #1 of 6

Question ID: 439000

You estimate the following GARCH model:

$$\sigma^2_n = 0.04 + 0.30\mu^2_{t-1} + 0.50\sigma^2_{n-1}$$

If the most recent volatility estimate and error term are 0.15 and 0.02, respectively, the long-run average variance is closest to:

- A) 0.23.
 - B) 0.20.
 - C) 0.04.
 - D) 0.16.
-

Question #2 of 6

Question ID: 438997

Which of the following statements is incorrect regarding the use of historical data and weighting schemes to estimate volatility?

- A) The volatility estimate from an autoregressive conditional heteroskedasticity model is a function of a short-run variance level and a series of squared variance observations.
 - B) An example of a volatility estimation weighting scheme is to assume a long-run variance level in addition to weighted squared return observations.
 - C) If an analyst's goal is to estimate the current level of volatility, she may want to weight recent data more heavily.
 - D) Straightforward volatility estimation approaches weight each observation equally in that more distant past returns have the same influence on estimated volatility as observations that are more recent.
-

Question #3 of 6

Question ID: 439001

Consider the following four GARCH equations:

$$\text{Equation 1: } \sigma^2_n = 0.83 + 0.05\mu^2_{n-1} + 0.93\sigma^2_{n-1}$$

$$\text{Equation 2: } \sigma^2_n = 0.06 + 0.04\mu^2_{n-1} + 0.95\sigma^2_{n-1}$$

$$\text{Equation 3: } \sigma^2_n = 0.60 + 0.10\mu^2_{n-1} + 0.94\sigma^2_{n-1}$$

$$\text{Equation 4: } \sigma^2_n = 0.03 + 0.03\mu^2_{n-1} + 0.93\sigma^2_{n-1}$$

Which of the following statements regarding these equations is (are) **CORRECT**?

- I. Equation 1 is a stationary model.
- II. Equation 2 shows no mean reversion
- III. Volatility will revert to a long run mean level faster with Equation 1 than it will for Equation 4.
- IV. Volatility will revert to a long run mean level faster with Equation 3 than it will for Equation 2.

- A) I only.
B) III only.
C) II and IV only.
D) II and III only.
-

Question #4 of 6

Question ID: 439003

GARCH(1,1) (generalized autoregressive conditional heteroskedastic) models of volatility may be useful for option traders because they:

- A) are useful in forecasting future volatility
 - B) are used in the Black-Scholes option pricing model.
 - C) provide efficient estimates of past volatility.
 - D) are the simplest volatility models to estimate.
-

Question #5 of 6

Question ID: 438999

A portfolio manager is using an exponentially weighted moving average (EWMA) model to forecast volatility for a particular market parameter. What is the implication of an EWMA weighting parameter value of 0.84?

- A) A greater weight is placed on the most recent change in parameter value than on the previous volatility estimate.
 - B) An equal weight is placed on the previous volatility estimate as on the most recent change in parameter value.
 - C) More information is required to determine the implication.
 - D) A greater weight is placed on the previous volatility estimate than on the most recent change in parameter value.
-

Question #6 of 6

Question ID: 439004

Traditional covariance calculations assume that all past observations receive the same weighting. One alternative is to apply differential weightings to past observations and create GARCH-type models to take into account the time variability of covariance. Which of the following statements is true regarding these alternative covariance calculations?

- I. If one uses a particular weighting scheme for variance calculations, one should use the same weighting scheme for the covariance calculations.
- II. If one uses a particular weighting scheme variance calculations, one should use a different weighting scheme for the covariance calculations.

A) Neither I nor II.

B) Both I and II.

C) I only.

D) II only.

Topic 29: Correlations and Copulas

Question #1 of 5

Question ID: 496385

Regarding the consistency condition to covariance, a variance-covariance matrix is positive-semidefinite if:

- A) it is externally dependent.
 - B) it is bivariate normal.
 - C) it is internally consistent.
 - D) one of its vectors can be transposed.
-

Question #2 of 5

Question ID: 496383

Regarding the comparison between correlation and dependence, which of the following statements is correct? A correlation of zero between two variables:

- I. does not imply that there is no dependence between the two variables.
 - II. suggests that the value of one variable must have a linear relationship with the other variable.
- A)** II only.
B) Both I and II.
C) Neither I nor II.
D) I only.
-

Question #3 of 5

Question ID: 496384

Assume an analyst uses the EWMA model with $\lambda = 0.80$ to update correlation and covariance rates. The correlation estimate for two variables X and Y on day $n - 1$ is 0.5. In addition, the estimated standard deviations on day $n - 1$ for variables X and Y are 2.5% and 3%, respectively. Also, the percentage change on day $n - 1$ for variables X and Y are 2% and 1%, respectively. What is the updated estimate of the covariance rate between X and Y on day n ?

- A)** 0.00053.
 - B)** 0.00023.
 - C)** 0.00034.
 - D)** 0.00004.
-

Question #4 of 5

Question ID: 496386

Which of the following statements is correct regarding the characteristics of copula functions?

- A)** A copula maps marginal distributions to a unique unknown distribution.
 - B)** A copula preserves the original marginal distributions while defining a correlation between them.
 - C)** The copula mapping process is typically done on a quartile-by-quartile basis.
 - D)** A copula creates two individual marginal distributions.
-

Question #5 of 5

Question ID: 496387

A Gaussian copula maps the marginal distribution of each variable to the:

- A)** standard normal distribution
- B)** bivariate Student's t-distribution.
- C)** binomial distribution.
- D)** F-distribution.

Topic 30: Simulation Methods

Question #1 of 5

Question ID: 641293

When conducting a Monte Carlo simulation, the first step is to:

- A) use a data generating process to generate random inputs that are assumed to follow a specific probability distribution.
 - B) allow for data analysis related to the properties of the probability distributions of the output variables.
 - C) generate scenarios based on randomly generated inputs drawn from a pre-specified probability distribution.
 - D) compute the present value of each path within the simulation.
-

Question #2 of 5

Question ID: 496403

Regarding the different ways to choose a probability distribution for simulation models, which of the following statements defines the bootstrapping technique?

- A) Finds a probability distribution that best fits historical data.
 - B) Constructs a future probability distribution based on a subjective guess of how an input variable will behave in the future.
 - C) Examines probability distributions of historical returns and assumes future returns will follow the same distribution.
 - D) Uses parameters to define the shape of a specific probability distribution for future input variables.
-

Question #3 of 5

Question ID: 641295

Which of the following statements best describe a disadvantage of the simulation approach to financial problem solving?

- A) If alternate assumptions are made in the data generating process the results may be very similar.
- B) In practice, with the use of an initial seed for the start of random draws, it is not possible to replicate results from previous experiments.
- C) Imprecise results may be present even with a very large number of simulation iterations when the assumptions of model inputs or the data generating process are unrealistic.

- D)** The complexity of markets and issues that are examined have also become increasingly complex, leading to low computation costs.
-

Question #4 of 5

Question ID: 641294

Ann Tessa, FRM, is choosing a probability distribution for a simulation model. She decides to examine probability distributions of historical returns and assumes future returns will follow that same distribution. Which simulation technique is Tessa most likely using when choosing a probability distribution?

- A)** Bootstrapping technique.
 - B)** Best fit technique.
 - C)** Parameter estimate technique.
 - D)** Subjective guess technique.
-

Question #5 of 5

Question ID: 496405

Regarding the relationship between the accuracy of a simulation model and the number of scenarios run in a simulation, which of the following statements is correct when increasing the number of scenarios from 1,000 to 4,000?

- A)** The confidence interval will be reduced by 50%.
- B)** The confidence interval will increase by 400%.
- C)** The confidence interval will be reduced by 75%.
- D)** The confidence interval will double.