Question #1 of 61

Question ID: 1572727

A company reports its past six years' earnings growth at 10%, 14%, 12%, 10%, –10%, and 12%. The company's average compound annual growth rate of earnings is *closest* to:

A) 8.0%.

B) 7.7%.

C) 8.5%.

Explanation

Geometric mean = $[(1.10)(1.14)(1.12)(1.10)(0.90)(1.12)]^{1/6} - 1 = 0.0766$, or 7.66% (Module 3.1, LOS 3.a)

Question #2 of 61

Question ID: 1572742

Cameron Ryan wants to make an offer on the condominium he is renting. He takes a sample of prices of condominiums in his development that closed in the last five months. Sample prices are as follows (amounts are in thousands of dollars): $125, $175, $150, $155 and $135. The sample standard deviation is *closest* to:

A) 370.00.

B) 19.24.

C) 38.47.

Explanation

Calculations are as follows:

1. Sample mean = (125 + 175 + 150 + 155 + 135) / 5 = 148
2. Sample Variance = $[(125 - 148)^2 + (175 - 148)^2 + (150 - 148)^2 + (155 - 148)^2 + (135 - 148)^2] / (5 - 1) = 1{,}480 / 4 = 370$
3. Sample Standard Deviation = $370^{1/2} = 19.24\%$.

(Module 3.1, LOS 3.b)

Question #3 of 61

Question ID: 1572754

An analyst gathers the following data about the mean monthly returns of three securities:

Security	Mean Monthly Return	Standard Deviation
X	0.9	0.7
Y	1.2	4.7
Z	1.5	5.2

Which security has the highest level of relative risk as measured by the coefficient of variation?

A) X.

B) Z.

C) Y.

Explanation

The coefficient of variation, CV = standard deviation / arithmetic mean, is a common measure of relative dispersion (risk). CV_X = 0.7 / 0.9 = 0.78; CV_Y = 4.7 / 1.2 = 3.92; and CV_Z = 5.2 / 1.5 = 3.47. Because a higher CV means higher relative risk, Security Y has the highest relative risk. (Module 3.1, LOS 3.b)

Question #4 of 61

Question ID: 1572747

An analyst takes a sample of yearly returns of aggressive growth funds resulting in the following data set: 25, 15, 35, 45, and 55. The mean absolute deviation (MAD) of the data set is closest to:

A) 16.

B) 12.

C) 20.

Explanation

Calculate the mean:

$$\frac{25+15+35+45+55}{5} = 35$$

To get the mean absolute deviation, sum the deviations around the mean (ignoring the sign), and divide by the number of observations:

$$\frac{10+20+0+10+20}{5} = 12$$

(Module 3.1, LOS 3.b)

Question #5 of 61

Question ID: 1572724

Trina Romel, mutual fund manager, is taking over a poor-performing fund from a colleague. Romel wants to calculate the return on the portfolio. Over the last five years, the fund's annual percentage returns were: 25, 15, 12, -8, and –14.

Determine if the geometric return of the fund will be less than or greater than the arithmetic return and calculate the fund's geometric return:

	Geometric Return	Geometric compared to Arithmetic	
A)	12.86%	greater than	✗
B)	4.96%	greater than	✗
C)	4.96%	less than	✓

Explanation

The geometric return is calculated as follows:

$[(1 + 0.25)(1 + 0.15)(1 + 0.12)(1 - 0.08)(1 – 0.14)]^{1/5} – 1,$

or $[1.25 \times 1.15 \times 1.12 \times 0.92 \times 0.86]^{0.2} – 1 = 0.4960$, or **4.96%**.

The geometric return will always be less than or equal to the arithmetic return. In this case the arithmetic return was 6%.

(Module 3.1, LOS 3.a)

Question #6 of 61

Question ID: 1572716

What is the compound annual growth rate for stock A which has annual returns of 5.60%, 22.67%, and -5.23%?

A) 7.08%.

B) 6.00%.

C) 8.72%.

Explanation

Compound annual growth rate is the geometric mean. $(1.056 \times 1.2267 \times 0.9477)^{1/3} - 1 = 7.08\%$

(Module 3.1, LOS 3.a)

Question #7 of 61

Question ID: 1572712

A portfolio is equally invested in Stock A, with an expected return of 6%, and Stock B, with an expected return of 10%, and a risk-free asset with a return of 5%. The expected return on the portfolio is:

A) 7.0%.

B) 7.4%.

C) 8.0%.

Explanation

(0.333)(0.06) + (0.333)(0.10) + 0.333(0.05) = 0.07

(Module 3.1, LOS 3.a)

Question #8 of 61

Question ID: 1572736

Consider the following set of stock returns: 12%, 23%, 27%, 10%, 7%, 20%,15%. The third quartile is:

A) 20.0%.

B) 21.5%.

C) 23%.

Explanation

The third quartile is calculated as: $L_y = (7 + 1)(75/100) = 6$. When we order the observations in ascending order: 7%, 10%, 12%, 15%, 20%, 23%, 27%, "23%" is the sixth observation from the left.

(Module 3.1, LOS 3.a)

Question #9 of 61

Question ID: 1572770

A portfolio's monthly returns follow a distribution with a kurtosis measure of 4.2. Relative to a portfolio with normally distributed returns, this portfolio has a:

A) higher probability of extreme upside returns and higher chance of extreme downside returns.

B) lower probability of extreme upside returns and higher chance of extreme downside returns.

C) higher probability of extreme upside returns and lower chance of extreme downside returns.

Explanation

A leptokurtic distribution (a distribution with kurtosis measure greater than 3) is more peaked in the middle (data more clustered around the mean) and has fatter tails at the extremes (greater probability of outliers).

(Module 3.2, LOS 3.c)

Question #10 of 61

Question ID: 1572745

Assume that the following returns are a sample of annual returns for firms in the clothing industry.

Firm 1	Firm 2	Firm 3	Firm 4	Firm 5
15%	2%	5%	(7%)	0%

The sample standard deviation is *closest* to:

A) 5.7.

B) 7.2.

C) 8.0.

Explanation

The sample variance is found by taking the sum of all squared deviations from the mean and dividing by (n – 1).

$$[(15 - 3)^2 + (2 - 3)^2 + (5 - 3)^2 + (-7 - 3)^2 + (0 - 3)^2] / (5 - 1) = 64.5$$

The sample standard deviation is found by taking the square root of the sample variance. $\sqrt{64.5} = 8.03$

(Module 3.1, LOS 3.b)

Question #11 of 61

Question ID: 1572763

For a unimodal distribution with negative skewness:

A) the mean is greater than the mode.

B) the median is greater than the mean.

C) the mode is less than the median.

Explanation

For a distribution with negative skewness, mean < median < mode.

(Module 3.2, LOS 3.c)

Question #12 of 61

Question ID: 1572758

In a negatively 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, mode, mean.

C) Mode, mean, median.

Explanation

In a negatively skewed distribution, the mean is less than the median, which is less than the mode.

(Module 3.2, LOS 3.c)

Question #13 of 61

Question ID: 1572744

For the past three years, Acme Corp. has generated the following sample returns on equity (ROE): 4%, 10%, and 1%. What is the sample variance of the ROE over the last three years?

A) 21.0(%^{2}). ✓

B) 4.6%. ✗

C) 21.0%. ✗

Explanation

$[(4 - 5)^2 + (10 - 5)^2 + (1 - 5)^2] / (3 - 1) = 21(\%^2)$.

(Module 3.1, LOS 3.b)

Question #14 of 61

Question ID: 1572726

An analyst observes the following four annual returns: R_1 = +10%, R_2 = –15%, R_3 = 0%, and R_4 = +5%. The average compound annual rate over the four years is *closest* to:

A) 0.0%. ✗

B) –0.5%. ✓

C) –5.0%. ✗

Explanation

$$G = [(1.10)(0.85)(1.00)(1.05)]^{0.25} - 1$$

$$G = (0.98175)^{0.25} - 1 = 0.9954 - 1 = -0.00459 \approx -0.5\%$$

Note: Taking a number to the 0.25 power is the same as taking the fourth root of the number. (Module 3.1, LOS 3.a)

Question #15 of 61

Question ID: 1572755

A distribution with a mode of 10 and a range of 2 to 25 would *most likely* be:

A) positively skewed.

B) negatively skewed.

C) normally distributed.

Explanation

The distance to the left from the mode to the beginning of the range is 8. The distance to the right from the mode to the end of the range is 15. Therefore, the distribution is skewed to the right, which means that it is positively skewed.

(Module 3.2, LOS 3.c)

Question #16 of 61

Question ID: 1572743

A sample of returns for four randomly selected assets in a portfolio is shown below:

Asset	Return (%)
A	1.3
B	1.4
C	2.2
D	3.4

What is the sample standard deviation of asset returns?

A) 0.88%.

B) 0.97%.

C) 1.13%.

Explanation

The sample standard deviation equals the square root of the sum of the squares of the position returns less the mean return, divided by the number of observations in the sample *minus one*.

Position	Return (%)	(Return – Mean)^2
A	1.3	0.60
B	1.4	0.46
C	2.2	0.02
D	3.4	1.76
Mean	8.3/4 = 2.075	Sum = 2.83
Std. Dev. = $[2.83 / (4 - 1)]^{0.5}$ = 0.97		

(Module 3.1, LOS 3.b)

Question #17 of 61

Question ID: 1572718

For the last four years, the returns for XYZ Corporation's stock have been 10.4%, 8.1%, 3.2%, and 15.0%. The equivalent compound annual rate is:

A) 9.1%.

B) 8.9%.

C) 9.2%.

Explanation

$(1.104 \times 1.081 \times 1.032 \times 1.15)^{0.25} - 1 = 9.1\%$

(Module 3.1, LOS 3.a)

Question #18 of 61

Question ID: 1572741

Find the respective mean and the mean absolute deviation (MAD) of a series of stock market returns.

Year 1	14%
Year 2	20%
Year 3	24%
Year 4	22%

A) 20%; 12%.

B) 22%; 3%.

C) 20%; 3%.

Explanation

(14 + 20 + 24 + 22) / 4 = 20 (mean)

Take the absolute value of the differences and divide by n:

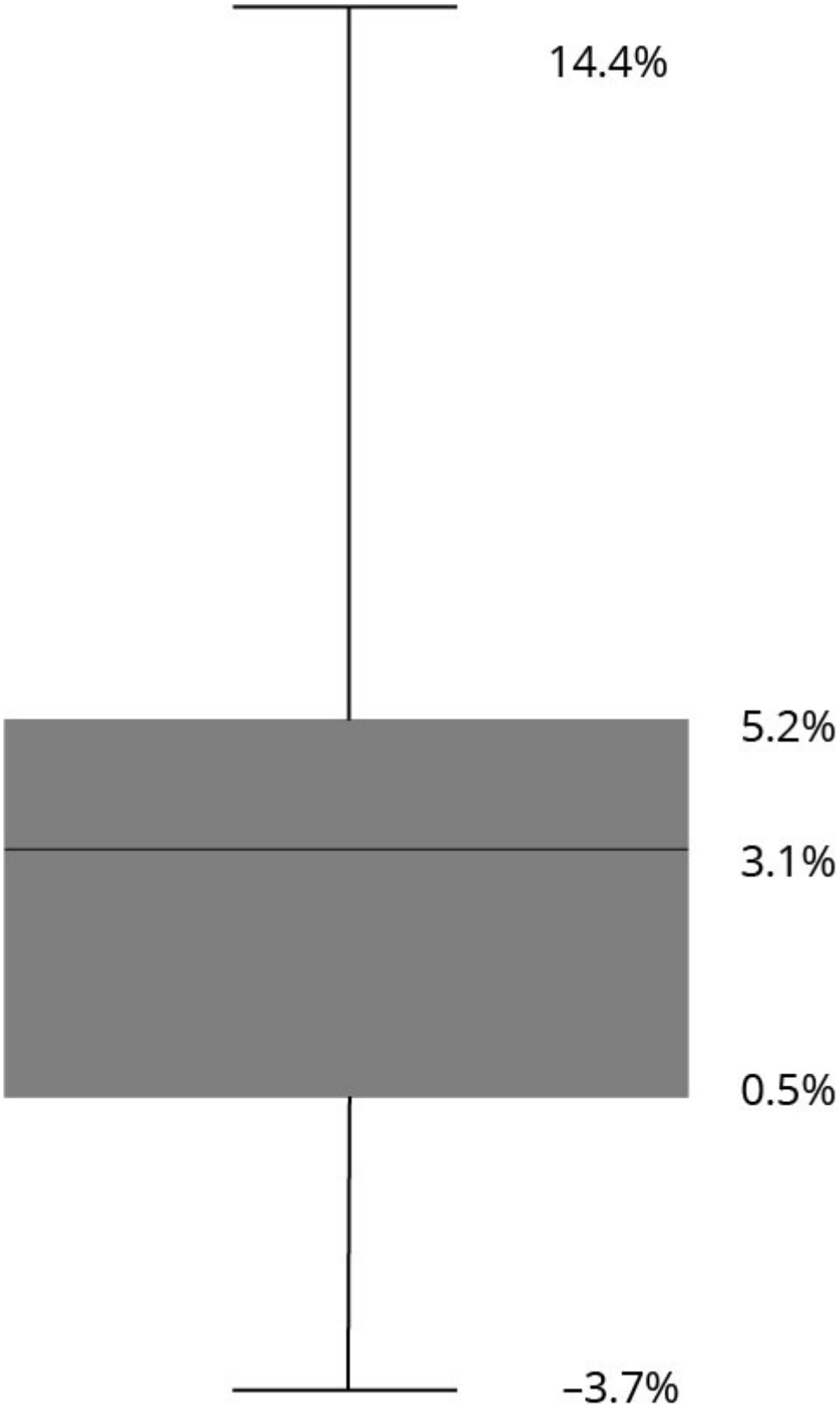
MAD = [|14 – 20| + |20 – 20| + |24 – 20| + |22 – 20|] / 4 = 3%.

(Module 3.1, LOS 3.b)

Question #19 of 61

Question ID: 1572734

Given the following box-and-whisker plot:



The interquartile range is:

A) 0.5% to 5.2%.

B) 3.1% to 5.2%.

C) 0.5% to 3.1%.

Explanation

The interquartile range is from the first quartile (25th percentile) to the third quartile (75th percentile) and is represented as the box in a box-and-whisker plot. The horizontal line within the box represents the median (50th percentile).

(Module 3.1, LOS 3.a)

Question #20 of 61

Question ID: 1572751

If Stock X's expected return is 30% and its expected standard deviation is 5%, Stock X's expected coefficient of variation is:

A) 0.167. ✓

B) 1.20. ✗

C) 6.0. ✗

Explanation

The coefficient of variation is the standard deviation divided by the mean: 5 / 30 = 0.167.

(Module 3.1, LOS 3.b)

Question #21 of 61

Question ID: 1572715

Given the following set of data:

17, 3, 13 , 3, 5, 9, 8

The value 8 is *most accurately* described as the:

A) mean. ✗

B) median. ✓

C) mode. ✗

Explanation

Median = middle of distribution = 8 (middle number);

Mean = (3 + 3 + 5 + 8 + 9 + 13 + 17) / 7 = 8.28;

Mode = most frequent observation = 3.

(Module 3.1, LOS 3.a)

Question #22 of 61

Question ID: 1572719

Given the following annual returns, what are the geometric and arithmetic mean returns, respectively?

2002	2003	2004	2005	2006
15%	2%	5%	-7%	0%

A) 1.45%; 3.00%.

B) 2.75%; 3.00%.

C) 2.75%; 5.80%.

Explanation

Geometric Mean: $(1.15 \times 1.02 \times 1.05 \times 0.93 \times 1.0)^{1/5} - 1 = 1.1454^{1/5} - 1 = 2.75\%$

Arithmetic Mean: (15% + 2% + 5% – 7% + 0%) / 5 = 3.00%

(Module 3.1, LOS 3.a)

Question #23 of 61

Question ID: 1572766

A distribution of returns that has a greater percentage of small deviations from the mean and a greater percentage of large deviations from the mean compared to a normal distribution:

A) has positive excess kurtosis.

B) has negative excess kurtosis.

C) is positively skewed.

Explanation

A distribution that has a greater percentage of small deviations from the mean and a greater percentage of large deviations from the mean will be leptokurtic and will exhibit positive excess kurtosis. The distribution will be taller (more peaked) with fatter tails than a normal distribution.

(Module 3.2, LOS 3.c)

Question #24 of 61

Question ID: 1572760

If a distribution is positively skewed, then generally:

A) mean < median < mode.

B) mean > median < mode.

C) mean > median > mode.

Explanation

When a distribution is positively skewed the right side tail is longer than normal due to outliers. The mean will exceed the median, and the median will generally exceed the mode because large outliers falling to the far right side of the distribution can dramatically influence the mean.

(Module 3.2, LOS 3.c)

Question #25 of 61

Question ID: 1572735

The following data points are observed returns.

4.2%, 6.8%, 7.0%, 10.9%, 11.6%, 14.4%, 17.0%, 19.0%, 22.5%

What return lies at the 70th percentile (70% of returns lie below this return)?

A) 14.4%.

B) 17.0%.

C) 19.0%.

Explanation

With 9 observations, the location of the 70th percentile is (9 + 1)(70 / 100) = 7. The seventh observation in ascending order is 17.0%.

(Module 3.1, LOS 3.a)

Question #26 of 61

Question ID: 1572768

Which of the following statements about kurtosis is *least* accurate? Kurtosis:

A) describes the degree to which a distribution is not symmetric about its mean. ✓

B) is used to reflect the probability of extreme outcomes for a return distribution. ✗

C) measures the peakedness of a distribution reflecting a greater or lesser concentration of returns around the mean. ✗

Explanation

The degree to which a distribution is not symmetric about its mean is measured by skewness. Excess kurtosis which is measured relative to a normal distribution, indicates the peakedness of a distribution, and also reflects the probability of extreme outcomes.

(Module 3.2, LOS 3.c)

Question #27 of 61

Question ID: 1572731

Consider the following statements about the geometric and arithmetic means as measures of central tendency. Which statement is *least* accurate?

A) The geometric mean may be used to estimate the average return over a one-period time horizon because it is the average of one-period returns. ✓

B) The difference between the geometric mean and the arithmetic mean increases with an increase in variability between period-to-period observations. ✗

C) The geometric mean calculates the rate of return that would have to be earned each year to match the actual, cumulative investment performance. ✗

Explanation

The *arithmetic* mean may be used to estimate the average return over a one-period time horizon because it is the average of one-period returns. Both remaining statements are true.

(Module 3.1, LOS 3.a)

Question #28 of 61

Question ID: 1572738

What is the seventh decile of the following data points?

81	84	91	97	102	108	110	112	115	121
128	135	138	141	142	147	153	155	159	162

A) 142.0.

B) 141.0.

C) 141.7.

Explanation

The formula for determining quantiles is: $L_y = (n + 1)(y) / (100)$. Here, we are looking for the seventh decile (70% of the observations lie below) and the formula is: (21)(70) / (100) = 14.7. The seventh decile falls between 141.0 and 142.0, the fourteenth and fifteenth numbers from the left. Since L is not a whole number, we interpolate as: 141.0 + (0.70)(142.0 – 141.0) = 141.7.

(Module 3.1, LOS 3.a)

Question #29 of 61

Question ID: 1572752

The mean monthly return on a sample of small stocks is 4.56% with a standard deviation of 3.56%. If the risk-free rate is 1%, what is the coefficient of variation?

A) 1.28.

B) 1.00.

C) 0.78.

Explanation

The coefficient of variation expresses how much dispersion exists relative to the mean of a distribution. It is a measure of risk per unit of mean return.

CV = *s / mean*. 3.56 / 4.56 = 0.781, or 78%.

(Module 3.1, LOS 3.b)

Question #30 of 61

Question ID: 1572750

What is the coefficient of variation for a distribution with a mean of 10 and a variance of 4?

A) 20%.

B) 25%.

C) 40%.

Explanation

Coefficient of variation, CV = standard deviation / mean. The standard deviation is the square root of the variance, or $4^{1/2} = 2$. So, CV = 2 / 10 = 20%.

(Module 3.1, LOS 3.b)

Question #31 of 61

Question ID: 1572764

A distribution that has positive excess kurtosis is:

A) more peaked than a normal distribution.

B) more skewed than a normal distribution.

C) less peaked than a normal distribution.

Explanation

A distribution with positive excess kurtosis is more peaked and has fatter tails than a normal distribution.

(Module 3.2, LOS 3.c)

Question #32 of 61

Question ID: 1572714

An investor has a portfolio with 10% cash, 30% bonds, and 60% stock. If last year's return on cash was 2.0%, the return on bonds was 9.5%, and the return on stock was 25%, what was the return on the investor's portfolio?

A) 12.17%.

B) 18.05%.

C) 11.77%.

Explanation

Find the weighted mean of the returns. (0.10 × 0.02) + (0.30 × 0.095) + (0.60 × 0.25) = 18.05%

Asset	Weight	Return	Weight × Return
Cash	10%	2%	10% × 2% = 0.2%
Bonds	30%	9.5%	30% × 9.5% = 2.85%
Stock	60%	25%	60% × 25% = 15%
Weighted Average Return ∑ **Weight × Probability**			**18.05%**

(Module 3.1, LOS 3.a)

Question #33 of 61

Question ID: 1572723

An investor has a $12,000 portfolio consisting of $7,000 in stock P with an expected return of 20% and $5,000 in stock Q with an expected return of 10%. What is the investor's expected return on the portfolio?

A) 15.8%.

B) 15.0%.

C) 30.0%.

Explanation

Here we need to multiply the returns by the proportion that each stock represents in the portfolio then sum.

Stock	Return	Invested	Proportion of Portfolio	Return × Proportion
P	20%	$7,000	7/12	20% × 7/12
Q	10%	$5,000	5/12	10% × 5/12
Total		**$12,000**		**15.83%**

(Module 3.1, LOS 3.a)

Question #34 of 61

Question ID: 1572722

Michael Philizaire decides to calculate the geometric average of the appreciation/deprecation of his home over the last five years. Using comparable sales and market data he obtains from a local real estate appraiser, Philizaire calculates the year-to-year percentage change in the value of his home as follows: 20, 15, 0, –5, –5. The geometric return is *closest* to:

A) 0.00%.

B) 4.49%.

C) 11.60%.

Explanation

The geometric return is calculated as follows:

$$[(1 + 0.20) \times (1 + 0.15) \times (1 + 0.0)\,(1 - 0.05)\,(1 - 0.05)]^{1/5} - 1,$$

or $[1.20 \times 1.15 \times 1.0 \times 0.95 \times 0.95]^{0.2} - 1 = 0.449$, or **4.49%**.

(Module 3.1, LOS 3.a)

Question #35 of 61

Question ID: 1572717

The respective arithmetic mean and geometric mean returns of the following series of stock market returns are:

Year 1	14%
Year 2	6%
Year 3	−5%
Year 4	20%

A) 8.75%; 8.62%.

B) 8.90%; 8.62%.

C) 8.75%; 8.34%.

Explanation

(14 + 6 + (-5) + 20) / 4 = 8.75.

$((1.14 \times 1.06 \times 0.95 \times 1.20)^{0.25} - 1 = 8.34\%$.

(Module 3.1, LOS 3.a)

Question #36 of 61

Question ID: 1572769

Which of the following statements concerning kurtosis is *most* accurate?

A) A distribution with kurtosis of +2 has fatter tails than a normal distribution. ✗

B) A leptokurtic distribution has excess kurtosis less than zero. ✗

C) A leptokurtic distribution has fatter tails than a normal distribution. ✓

Explanation

A leptokurtic distribution is more peaked than normal and has fatter tails. However, the excess kurtosis is greater than zero.

(Module 3.2, LOS 3.c)

Question #37 of 61

Question ID: 1572739

What are the median and the third quintile of the following data points, respectively?

9.2%, 10.1%, 11.5%, 11.9%, 12.2%, 12.8%, 13.1%, 13.6%, 13.9%, 14.2%, 14.8%, 14.9%, 15.4%

A) 12.8%; 13.6%. ✗

B) 13.1%; 13.6%. ✗

C) 13.1%; 13.7%. ✓

Explanation

The median is the midpoint of the data points. In this case there are 13 data points and the midpoint is the 7^{th} term.

The formula for determining quantiles is: $L_y = (n + 1)(y) / (100)$. Here, we are looking for the third quintile (60% of the observations lie below) and the formula is: (14)(60) / (100) = 8.4. The third quintile falls between 13.6% and 13.9%, the 8^{th} and 9^{th} numbers from the left. Since L is not a whole number, we interpolate as: 0.136 + (0.40)(0.139 – 0.136) = 0.1372, or 13.7%.

(Module 3.1, LOS 3.a)

Question #38 of 61

Question ID: 1572733

An analyst compiles the returns on Fund Q over the last four years:

Year	Return
1	4%
2	3%
3	2%
4	30%

Which of the following will result in the *lowest* measure of the mean return?

A) The arithmetic mean.

B) The geometric mean.

C) The harmonic mean.

Explanation

$$\text{Harmonic mean} = \frac{4}{\frac{1}{1.04}+\frac{1}{1.03}+\frac{1}{1.02}+\frac{1}{1.30}} - 1 = 0.0864 = 8.64\%$$

$$\text{Geometric mean} = \left[(1.04)\,(1.03)\,(1.02)\,(1.30)\right]^{\frac{1}{4}} - 1 = 0.0917 = 9.17\%$$

$$\text{Arithmetic mean} = \frac{4\%+3\%+2\%+30\%}{4} = 9.75\%$$

(Module 3.1, LOS 3.a)

Question #39 of 61

Question ID: 1572746

Annual Returns on ABC Mutual Fund									
Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
11.0%	12.5%	8.0%	9.0%	13.0%	7.0%	15.0%	2.0%	-16.5%	11.0%

Assuming a mean of 7.2%, what is the sample standard deviation of the returns for ABC Mutual Fund for the period from Year 1 to Year 10?

A) 7.8%.

B) 9.8%.

C) 9.1%.

Explanation

Standard deviation = $[\sum_i (x_i - \overline{X})^2 / (n - 1)]^{1/2} = (744.10 / 9)^{1/2} = = 9.1\%$.

(Module 3.1, LOS 3.b)

Question #40 of 61

Question ID: 1572761

Which of the following statements concerning skewness is *least accurate*? A distribution with:

A) skew equal to 1 is not symmetrical. ✗

B) negative skewness has a large number of outliers on its left side. ✗

C) positive skewness has a long left tail. ✓

Explanation

A distribution with positive skewness has long *right* tails.

(Module 3.2, LOS 3.c)

Question #41 of 61

Question ID: 1572728

A 5% trimmed mean ignores the:

A) highest and lowest 5% of observations. ✗

B) highest and lowest 2.5% of observations. ✓

C) lowest 5% of observations. ✗

Explanation

A 5% trimmed means discards the highest 2.5% and lowest 2.5% of observations and is the arithmetic average of the remaining 95% of observations.

(Module 3.1, LOS 3.a)

Question #42 of 61

Question ID: 1572725

The annual returns on 5 portfolio investments for the last year are shown in the following table. What is the return on the portfolio and the geometric mean of the returns on the portfolio investments?

Investment	Invested Amount	Return (%)
A	10,000	12
B	10,000	14
C	10,000	9
D	10,000	13
E	10,000	7

A) 11.00; 10.78.

B) 11.00; 10.97.

C) 11.64; 10.97.

Explanation

Arithmetic Mean: 12 + 14 + 9 + 13 + 7 = 55; 55 / 5 = 11

Geometric Mean: $[(1.12 \times 1.14 \times 1.09 \times 1.13 \times 1.07)^{1/5}] - 1 = 10.97\%$

(Module 3.1, LOS 3.a)

Question #43 of 61

Question ID: 1572759

Twenty Level I CFA candidates in a study group took a practice exam and want to determine the distribution of their scores. When they grade their exams they discover that one of them skipped an ethics question and subsequently filled in the rest of his answers in the wrong places, leaving him with a much lower score than the rest of the group. If they include this candidate's score, their distribution will *most likely*:

A) have a mean that is less than its median.

B) be positively skewed.

C) have a mode that is less than its median.

Explanation

With the low outlier included, the distribution will be negatively skewed. For a negatively skewed distribution, the mean is less than the median, which is less than the mode.

(Module 3.2, LOS 3.c)

Question #44 of 61

Question ID: 1572771

The correlation between two variables is –0.74. The *most appropriate* way to interpret this correlation is that:

A) if one of the variables increases, there is a 74% probability that the other variable will decrease. ✗

B) the two variables have a negative linear association. ✓

C) there is unlikely to be a strong linear relationship between the two variables. ✗

Explanation

A correlation coefficient of –0.74 suggests a relatively strong negative linear association between the two variables. We cannot interpret the correlation coefficient directly as a measure of the probability that the two variables will change in opposite directions.

(Module 3.2, LOS 3.d)

Question #45 of 61

Question ID: 1572732

The following annualized monthly return measures have been calculated for an investment based on its performance over the last 72 months.

Arithmetic mean	6.8%
Geometric mean	6.0%
90% Winsorized mean	5.5%

If for one month in the period the return was extremely high, which measure *best* reflects the central tendency of the investment's returns?

A) Winsorized mean. ✓

B) Geometric mean. ✗

C) Arithmetic mean. ✗

Explanation

A winsorized mean is a technique for removing the distorting effects of outliers by replacing them with less extreme values. The arithmetic and geometric means are based on all observations and therefore include the impact of outliers.

(Module 3.1, LOS 3.a)

Question #46 of 61

Question ID: 1572756

In a positively 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) Mode, median, mean. ✓

C) Mean, median, mode. ✗

Explanation

In a positively skewed distribution, the mode is less than the median, which is less than the mean.

(Module 3.2, LOS 3.c)

Question #47 of 61

Question ID: 1572720

The owner of a company has recently decided to raise the salary of one employee, who was already making the highest salary in the company, by 40%. Which of the following value(s) is (are) expected to be affected by this raise?

A) mean only. ✓

B) both mean and median. ✗

C) median only. ✗

Explanation

Mean is affected because it is the sum of all values / number of observations. Median is not affected as it the midpoint between the top half of values and the bottom half of values.

(Module 3.1, LOS 3.a)

Question #48 of 61

Question ID: 1572767

Which of the following statements concerning a distribution with positive skewness and positive excess kurtosis is *least* accurate?

A) It has a lower percentage of small deviations from the mean than a normal distribution. ✓

B) It has fatter tails than a normal distribution. ✗

C) The mean will be greater than the mode. ✗

Explanation

A distribution with positive excess kurtosis has a higher percentage of small deviations from the mean than normal. So it is more "peaked" than a normal distribution. A distribution with positive skew has a mean > mode.

(Module 3.2, LOS 3.c)

Question #49 of 61

Question ID: 1572753

The mean monthly return on a security is 0.42% with a standard deviation of 0.25%. What is the coefficient of variation?

A) 168%. ✗

B) 60%. ✓

C) 84%. ✗

Explanation

The coefficient of variation expresses how much dispersion exists relative to the mean of a distribution and is found by CV = *s* / *mean*, or 0.25 / 0.42 = 0.595, or 60%.

(Module 3.1, LOS 3.b)

Question #50 of 61

Question ID: 1572737

What does it mean to say that an observation is at the sixty-fifth percentile?

A) The observation falls within the 65th of 100 intervals. ✗

B) 65% of all the observations are below that observation. ✓

C) 65% of all the observations are above that observation.

Explanation

If the observation falls at the sixty-fifth percentile, 65% of all the observations fall below that observation.

(Module 3.1, LOS 3.a)

Question #51 of 61

Question ID: 1572748

If the historical mean return on an investment is 2.0%, the standard deviation is 8.8%, and the risk free rate is 0.5%, what is the coefficient of variation (CV)?

A) 0.17.

B) 4.40.

C) 0.23.

Explanation

The CV = the standard deviation of returns / mean return

= 8.8% / 2.0% = 4.4.

The CV is a measure of risk per unit of mean return. When ranking portfolios based on the CV, a lower value is preferred to higher.

(Module 3.1, LOS 3.b)

Question #52 of 61

Question ID: 1572740

Given the following annual returns, what is the mean absolute deviation?

2000	2001	2002	2003	2004
15%	2%	5%	-7%	0%

A) 0.0%.

B) 3.0%.

C) 5.6%.

Explanation

The mean absolute deviation is found by taking the mean of the absolute values of deviations from the mean. (|15 – 3| + |2 – 3| + |5 – 3| + |-7 – 3| + |0 – 3|) / 5 = 5.60%

(Module 3.1, LOS 3.b)

Question #53 of 61

Question ID: 1572765

A distribution that is more peaked than a normal distribution is termed:

A) platykurtic. ✗

B) leptokurtic. ✓

C) skewed. ✗

Explanation

A distribution that is more peaked than normal is leptokurtic. A leptokurtic distribution has fatter tails compared to a normal distribution. This means there is a greater chance of observing extreme outcomes. Market returns are leptokurtic.

A distribution that is flatter than a normal distribution is termed platykurtic.

(Module 3.2, LOS 3.c)

Question #54 of 61

Question ID: 1572749

Returns for a portfolio over the last four years are shown below. Treating these returns as a sample, what is their coefficient of variation (CV)?

Year	Return
1	17.0%
2	12.2%
3	3.9%
4	–8.4%

A) 1.80. ✓

B) 1.56. ✗

C) 0.55. ✗

Explanation

The coefficient of variation is equal to the standard deviation of returns divided by the mean return.

Mean return = (17.0% + 12.2% + 3.9% – 8.4%) / 4 = 6.175%

Year	Return	$(R - 6.175\%)^2$
1	17.0%	117.18
2	12.2%	36.30
3	3.9%	5.18
4	–8.4%	212.43
		Sum = 371.09

Sample standard deviation = $[371.09 / (4 - 1)]^{0.5}$ = 11.12%

Coefficient of variation = 11.12% / 6.175% = 1.80

(Module 3.1, LOS 3.b)

Question #55 of 61

Question ID: 1572729

An analyst calculates a winsorized mean return of 3.2% for an investment fund. This measure *most likely*:

A) equally weights all returns.

B) replaces outliers with less extreme returns.

C) captures the compounded growth rate of the fund.

Explanation

The winsorized mean is a technique for dealing with outliers. For example, a 90% winsorized mean replaces the lowest 5% of values with the fifth percentile, and replaces the highest 5% of values with the 95th percentile. The arithmetic mean weights all observations equally. The geometric mean captures the compounded growth rate of the fund.

(Module 3.1, LOS 3.a)

Question #56 of 61

Question ID: 1572730

Over the last five years, an investment fund's monthly returns were relatively stable apart from last year, where two extremely high returns were recorded. If the arithmetic mean for the fund's monthly returns over the period is 6.7%, a trimmed or winsorized mean return is *most likely* to be:

A) higher than the arithmetic mean. ✗

B) lower than the arithmetic mean. ✓

C) equal to the arithmetic mean. ✗

Explanation

A trimmed mean discards a percentage of the highest and lowest observations, while a winsorized mean replaces a percentage of the highest and lowest observations with less extreme values. In this case the arithmetic mean would be influenced by the two highly positive returns, while a trimmed or winsorized mean would adjust for them and would likely be lower than the arithmetic mean.

(Module 3.1, LOS 3.a)

Question #57 of 61

Question ID: 1572772

The correlation coefficient between the return on an investment and the rate of economic growth is –0.065. An analyst should *most likely* interpret this correlation coefficient as indicating that returns on this investment are:

A) not related linearly to economic growth. ✓

B) unrelated to economic growth. ✗

C) negatively related to economic growth. ✗

Explanation

A correlation coefficient near zero indicates that two variables exhibit no linear relationship. This does not necessarily mean that the variables are unrelated because they might exhibit a nonlinear relationship.

(Module 3.2, LOS 3.d)

Question #58 of 61

Question ID: 1572762

If an analyst concludes that the distribution of a large sample of returns is positively skewed, which of the following relationships involving the mean, median, and mode is *most likely*?

A) Mean > median > mode.

B) Mean < median < mode.

C) Mean > median < mode.

Explanation

For the positively skewed distribution, the mode is less than the median, which is less than the mean. (Module 3.2, LOS 3.c)

Question #59 of 61

Question ID: 1572713

An investor has the following assets:

- $5,000 in bonds with an expected return of 8%.
- $10,000 in equities with an expected return of 12%.
- $5,000 in real estate with an expected return of 10%.

What is the portfolio's expected return?

A) 10.50%.

B) 11.00%.

C) 10.00%.

Explanation

Expected return is the weighted average of the individual expected values. The expected return is: [(5,000) × (10.00) + (5,000) × (8.00) + (10,000) × (12.00)] / 20,000 = 10.50%.

(Module 3.1, LOS 3.a)

Question #60 of 61

Question ID: 1572757

For a positively skewed distribution, the median is greater than:

A) the mean, but less than the mode.

B) the mode, but less than the mean.

C) both the mode and the mean.

Explanation

For a positively skewed distribution, the mean is greater than the median, and the median is greater than the mode. Their order reverses for a negatively skewed distribution.

(Module 3.2, LOS 3.c)

Question #61 of 61

Question ID: 1572721

For the investments shown in the table below:

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

Which of the following statements is *most accurate*?

A) The mean is equal to the median.

B) The median is equal to the mode.

C) The mean is equal to the mode.

Explanation

The median is the mid-point or central number of returns arranged from highest to lowest or lowest to highest. In this case: 7, 8, 9, **12**, 12, 13, 14. The median return is 12%. The mode is the return that occurs most frequently. In this case, 12% is also the mode. The mean is 75 / 7 = 10.71%.

(Module 3.1, LOS 3.a)