CHAPTER 2
ORGANIZING VISUALIZING AND DESCRIBING DATA

1. (C) **Winsorized 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 observation and therefore include the impact of outliers.

(Study Session 1, Module 2.3, LOS 2.h)

Related Material

SchweserNotes - Book 1

2. (C) **positively skewed.**

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.

(Study Session 1, Module 2.5, LOS 2.l)

Related Material

SchweserNotes - Book 1

3. (B) **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.

(Study Session 1, Module 2.4, LOS 2.i)

Related Material

SchweserNotes - Book 1

4. (A) **7.7%**

Explanation

Geometric mean = $[(1.10)(1.14)(1.12)(1.10)(0.90)(1.12)]^{1/6} – 1 = 0.0766$, or 7.66%

For Further Reference:

(Study Session 1, Module 2.3, LOS 2.g)

CFA® Program Curriculum, Volume 1, Page 103

Related Material

SchweserNotes - Book 1

5. (C) 23.3%

Explanation

Total number of frequencies = 5 + 7 + 9 + 6 + 3 = 30.

The relative frequency of the 0% -10% interval is its frequency (7) as a proportion of the total frequency: 7 / 30 = 23.3%.

(Study Session 1, Module 2.1, LOS 2.c)

Related Material

SchweserNotes - Book 1

6. (A) Height of the corresponding bar.

Explanation

In a histogram, intervals are placed on horizontal axis, and frequencies are placed on the vertical axis. The frequency of the particular interval is given by value on the vertical axis, or the height of the corresponding bar.

(Study session 1, Module 2.2, LOS 2.e)

Related Material

SchweserNotes - Book 1

7. (A) 20%

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%

(Study Session 1, Module 2.4, LOS 2.j)

Related Material

SchweserNotes - Book 1

8. (A) time series data.

Explanation

Time series data are taken at equally spaced intervals, such as monthly, quarterly, or annual. Cross sectional data are taken at a single point in time. An example of cross – sectional data is dividend yields on 500 stocks as of the end of a year.

(Study session 1, Module 2.1, LOS 2.a)

Related Material

SchweserNotes - Book 1

9. (A) 3.87%

Explanation

Year	Return	Deviations below 4%	Squared deviation
1	2.00%	-2.00%	0.0004
2	9.00%		
3	8.00%		
4	-5.00%	-9.00%	0.0081
5	6.00%		
6	8.00%		
7	9.00%		
8	-3.00%	-7.00%	0.0049
9	10.00%		
10	3.00%	-1.00%	0.0001
		TOTAL	0.0135

Target semi deviation = $\sqrt{\frac{0.0135}{10-1}}$ = 0.0387 = 3.87%

(Study Session 1, Module 2.4, LOS 2.k)

Related Material

SchweserNotes - Book 1

10. (C) The relative frequency of the interval -2.0% to 0.0% equals the relative frequency of the interval 2.0% to 4.0%.

Explanation

When completed, the frequency distribution table should look as follows:

Frequency Distribution of Monthly Small Cap Stock Returns		
Interval	Absolute Frequency	Relative Frequency
-4.0% to -2.0%	1	11.1%
-2.0% to 0.0%	1	11.1%
0.0% to 2.0%	5	55.6%
2.0% to 4.0%	2	22.2%
Total	9	100.0%

The relative frequency of the interval -2.0% to 0.0% does not equal the relative frequency of the interval 2.0% to 4.0%.

(Study Session 1, Module 2.1, LOS 2.C)

Related Material

SchweserNotes - Book 1

11. (C) joint frequencies.

Explanation

The values shown in the table are joint frequencies. For example, 20 is the joint frequency of large-cap stocks and value stocks. Marginal frequencies and relative frequencies can be calculated from this table. For example, the marginal frequency of growth stocks is 25 + 50 =75, and the relative frequency of value stocks among small-cap stocks is 5 / (5 + 25) = 16.7%

(Study Session 1, Module 2.1, LOS 2.d)

Related Material

SchweserNotes - Book 1

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

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.

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

SchweserNotes - Book 1

13. (A) 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%

(Study Session 1, Module 2.4, LOS 2.j)

Related Material

SchweserNotes - Book 1

14. (C) Mean > median > mode.

Explanation

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

(Study Session 1, Module 2.5, LOS 2.l)

Related Material

SchweserNotes - Book 1

15. (C) 9.1 %

Explanation

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

(Study Session 1, Module 2.4, LOS 2.j)

Related Material

SchweserNotes - Book 1

16. (C) height of the corresponding bar.

Explanation

In a histogram, intervals are placed on the horizontal axis, and frequencies are placed on the vertical axis. The frequency of a particular interval is given by the value on the vertical axis, or the height of the corresponding bar.

(Study Session 1, Module 2.2, LOS 2.e)

Related Material

SchweserNotes - Book 1

17. (C) Histogram.

Explanation

A histogram depicts the shape and range of a distribution of numerical data.

(Study Session 1, Module 2.2, LOS 2.e)

Related Material

SchweserNotes - Book 1

18. (A) Word cloud.

Explanation

A word cloud is a visual way of representing unstructured textual data. Each word is displayed in a size proportional to its frequency in the text.

Related Material

SchweserNotes - Book 1

19. (C) positive skewness has a long left tail.

Explanation

A distribution with positive skewness has long right tails.

(Study Session 1, Module 2.5, LOS 2.m)

Related Material

SchweserNotes - Book 1

20. (C) nominal data.

Explanation

Nominal data are categorical data that cannot be ordered in a logical manner. An example would be industry classifications by GICS. The dividend yield of the S&P 500 is an example of numerical data as represents measured or counted quantities. It is also an example continuous data as the dividend yield can take on any numerical value within a range of specified values.

(Study Session 1, Module 2.1, LOS 2.a)

Related Material

SchweserNotes - Book 1

21. (C) The relative frequency of the second interval is less than 15%

Explanation

The relative interval frequency is (interval frequency) / (total number) = 28.7%. The number of observation is 5 + 10 + 15 + 5 = 35

(Study Session 1, Module 2.1, LOS 2.c)

Related Material

SchweserNotes - Book 1

22. (B) 2.75%; 3.00%

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%

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

SchweserNotes - Book 1

23. (B) organize data into overlapping groups.

Explanation

Data in a frequency distribution must belong to only one group or interval. Intervals are mutually exclusive and non-overlapping.

(Study session 1, Module 2.1, LOS 2.c)

Related Material

SchweserNotes - Book 1

24. (C) A histogram connects points with a straight line.

Explanation

In constructing a frequency polygon, the midpoint of each interval is plotted on the horizontal axis and the frequency of each interval is plotted on the vertical axis. Points are then connected with straight lines. A histogram is a bar chart of data that has been grouped into a frequency distribution – because it is a bar chart, there are no individual points to connect.

(Study Session 1, Module 2.2, LOS 2.e)

Related Material

SchweserNotes - Book 1

25. (C) paired observation of two variables.

Explanation

Scatter plots display paired observation of two variables. They do not require the two variables to have a dependent relationship, but they can be a tool for analyzing whether one of the variables is dependent on the other.

(Study Session 1, Module 2.2, LOS 2.e)

Related Material

SchweserNotes - Book 1

26. (A) cross-sectional data.

Explanation

Cross-sectional data are a sample of observations taken at a single point in time-series is a sample of observation taken at specific and equally spaced points in time. Panel data consist of a cross- section of time series data.

(Study session 1, Module 2.1, LOS 2.a)

Related Material

SchweserNotes - Book 1

27. (B) -0.5%

Explanation

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

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

Note: Taking a number to the 0.25 power is the same as taking the fourth root of the number.

For Further Reference:

(Study Session 1, Module 2.3, LOS 2.g)

CFA® Program Curriculum Volume 1, page 103

Related Material

SchweserNotes - Book 1

28. (A) 17.0%

Explanation

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

(Study Session 1, Module 2.4, LOS 2.i)

Related Material

SchweserNotes - Book 1

29. (A) 4.49%

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%**

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

SchweserNotes - Book 1

30. (C) 5.6%

Explanation

The mean absolute deviation is found by taking the mean of the absolute values of deviations from the mean.

$(|15 - 3| + |2 - 3| + |5 - 3| + |-7 - 3| + |0 - 3|) / 5 = 5.60\%$

(Study Session 1, Module 2.4, Los 2.j)

Related Material

SchweserNotes - Book 1

31. (B) have a mean 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 that the mode.

(Study Session 1, Module 2.5, Los 2.l)

Related Material

SchweserNotes - Book 1

32. (A) The harmonic Mean.

Explanation

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

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

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

(Study Session 1, Module 2.3, LOS 2.h)

Related Material

SchweserNotes - Book 1

33. (A) It has a lower percentage of small deviations from the mean that a normal distribution.

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.

(Study Session 1, Module 2.5, LOS 2.m)

Related Material

SchweserNotes - Book 1

34. (B) mean 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.

(Study Session1, Module 2.3, LOS 2.g)

Related Material

SchweserNotes - Book 1

35. (B) 65% of all the observation are below that observation.

Explanation

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

(Study Session 1, Module 2.4, LOS 2.i)

Related Material

SchweserNotes - Book 1

36. (A) 7.0%

Explanation

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

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

SchweserNotes - Book 1

37. (B) panel data.

Explanation

Panel data are a combination of time series and cross-sectional data. Dividend yields for several stocks are cross-sectional data, and data for each stock over the last five years are time series.

(Study Session 1, Module 2.1, LOS 2.a)

Related Material

SchweserNotes - Book 1

38. (B) correlations among multiple variables.

Explanation

A scatter plot matrix is a set of scatter plots that is useful for visualizing correlation among multiple pairs of variables.

(Study Session 1, Module 2.2, LOS 2.e)

Related Material

SchweserNotes - Book 1

39. (C) 20.4%

Explanation

62 + 40 = 102, 102 / 500 = 0.204 or 20.4%

(Study Session 1, Module 2.1, LOS 2.c)

Related Material

SchweserNotes - Book 1

40. (B) leptokurtic.

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.

(Study Session 1, Module 2.5, LOS 2.m)

Related Material

SchweserNotes - Book 1

41. (C) a combination of time series and cross-sectional data.

Explanation

Panel data combine time series and cross-sectional data into a single display, typically a table. For example, annual rates of return for the last 10 year (time series) can be shown for selected companies' common stocks (cross-section).

(Study Session 1, Module 2.1, LOS 2.a)

Related Material

Schweser Notes - Book 1

42. (A) a one-dimensional array.

Explanation

A one-dimensional array is used when tabulating a single variable.

(Study Session 1, Module 2.1, LOS 2.b)

Related Material

Schweser Notes - Book 1

43. (A) No.

Explanation

Standard III(D) Performance Presentation does not prohibit showing past performance of fund managed at a previous firm as part of a performance track record if accompanied by appropriate disclosures. In this instance, Arc clearly detailed that the performance occurred while Martin was the manager of Alpha Emerging Markets Fund. A minimum 5-year performance history is a requirement for GIPS compliance, but use of GIPS is not required by Standard III(D).

For Further Reference:

(Study Session 1, Module 2.3, LOS 2.g)

CFA® Program Curriculum, Volume 6, page 285

CFA® Program Curriculum, Volume 6, Page 285

CFA® Program Curriculum, Volume 6, Page 305, 310, and 312

Related Material

Schweser Notes - Book 1

44. (C) scatter plot.

Explanation

A scatter plot is useful for visualizing the relationship between two variables. An advantages of scatter plots is that they can reveal non linear relationship that measures of linear relationship such as correlation might not show.

(Study Session 1, Module 2.2, LOS 2.e)

Related Material

Schweser Notes - Book 1

45. (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.

(Study Session 1, Module 2.5, LOS 2.m)

Related Material

Schweser Notes - Book 1

46. (C) banking sector companies over the last three years.

Explanation

"Banking sector companies" and "the last three years" represent two dimensions. One company's earnings per share over the last five years is a time series, and earnings per share for 100 companies in the most recent period are a cross section, either of which require only a one-dimensional array.

(Study Session 1, Module 2.1, LOS 2.b)

Related Material

Schweser Notes - Book 1

47. (A) The median 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 =10.1=71%.

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

48. (C) 700

Explanation

700 – 800, lower boundary = 700

(Study Session 1, Module 2.1, LOS 2.c)

Related Material

Schweser Notes - Book 1

49. (A) 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%.

(study Session 1, Module 2.4, LOS 2.j)

Related Material

Schweser Notes - Book 1

50. (A) 0.167.

Explanation

The coefficient of variation is the standard deviation divided by the mean:

5 / 30 = 0.167.

(Study Session 1, Module 2.4, LOS 2.j)

Related Material

Schweser Notes - Book 1

51. (A) 90%

Explanation

Total number of observations = 30.

Cumulative relative frequency = (5 + 7 + 9 + 6) / 30 = 90%

(Study Session 1, Module 2.1, LOS 2.c)

Related Material

Schweser Notes - Book 1

52. (C) 50.

Explanation

For 50 companies, the model incorrectly predicted that they would not default on their loan payments (i.e., predicted "no" and actual default "yes"). The total number of companies predicted not to default is 80, and for 30 companies the model correctly predicted that they would not default (i.e., predicted "no" and actual default "no").

(Study Session 1, Module 2.1 LOS 2.d)

Related Material

Schweser Notes - Book 1

53. (A) three dimensions.

Explanation

A bubble line chart is a version of a line chart where data point are replaced with varying sized bubbles to represent a third dimension of the data (i.e., one not represented by either the vertical or horizontal axis).

(Study Session 1, Module 2.2, LOS 2.e)

Related Material

Schweser Notes - Book 1

54. (B) 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.

$\sqrt{64.5} = 8.03$

(Study Session 1, Module 2.4, LOS 2.j)

Related Material

Schweser Notes - Book 1

55. (A) 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.

(Study Session 1, Module 2.5, LOS 2.l)

Related Material

Schweser Notes - Book 1

56. (A) 15.8%

Explanation

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

Stock	Return	Invested	Proportion of Portfolio	Return x Proportion
P	20%	$7,000	7/127/12	20% x 7/12
Q	10%	$5,000	5/125/12	10% x 5/12
Total		**$12,000**		**15.83%**

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

57. (A) Mode, median, mean.

Explanation

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

(Study Session 1, Module 2.5, LOS 2.l)

Related Material

Schweser Notes - Book 1

58. (A) 0.5% to 5.2%

Explanation

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

(Study Session 1, Module 2.4, LOS 2.i)

Related Material

Schweser Notes - Book 1

59. (B) 11.00; 10.97.

Explanation

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

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

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

60. (A) replaces outliers with less extreme returns.

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 95% percentile. The arithmetic mean weights all observations equally. The geometric mean captures the compounded growth rate of the fund.

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

61. (B) 12.

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:

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

(Study Session 1, Module 2.4, LOS 2.j)

Related Material

Schweser Notes - Book 1

62. (C) 8.75%; 8.34%

Explanation

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

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

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

63. (B) 21.0(%^{2}).

Explanation

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

(Study Session 1, Module 2.4, LOS2.j)

Related Material

Schweser Notes - Book 1

64. (B) Median.

Explanation

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

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

Mode = Most frequent observation = 3.

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

65. (A) 18.05%.

Explanation

Find the weighted mean of the returns.

(0.10 x 0.02) + (0.30 x 0.095) + (0.60 x 0.25) = 18.05%

Assets	Weight	Return	Weight x Return
Cash	10%	2%	10% x 2% =0.2%
Bonds	30%	9.5%	30% x 9.5% = 2.85%
Stock	60%	25%	60% x 25% = 15%
Weighted Average Return **Σ Weight x probability**			18.05%

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

66. (C) more peaked than a normal distribution.

Explanation

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

(Study Session 1, Module 2.5, LOS 2.m)

Related Material

Schweser Notes - Book 1

67. (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%

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

68. (A) Mean, median, mode.

Explanation

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

(Study Session 1, Module 2.5, LOS 2.l)

Related Material

Schweser Notes - Book 1

69. (C) highest and lowest 2.5% of observation.

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.

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

70. (B) 0.97%

Explanation

The sample standard deviation equals the square root of the squares of the position returns less than mean return, dividend by the number of observations is 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		

(Study Session 1, Module 2.4, LOS 2.j)

Related Material

Schweser Notes - Book 1

71. (B) a two-dimensional array.

Explanation

The information is an example of panel data and requires a two-dimensional array because there are multiple countries and multiple years.

(Study Session 1, Module 2.1, LOS 2.b)

Related Material

Schweser Notes - Book 1

72. (B) the mode, but less than 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.

(Study Session 1, Module 2.5, LOS 2.l)

Related Material

Schweser Notes - Book 1

73. (B) 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.

For Further Reference:

(Study Session 1, Module 2.4 LOS 2.j)

CFA® Program Curriculum, Volume 1, page 126

Related Material

Schweser Notes - Book 1

74. (B) 19.24.

Explanation

Calculation 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%

(Study Session 1, Module 2.4 LOS 2.j)

Related Material

Schweser Notes - Book 1

75. (A) 7.08%

Explanation

Compound annual growth rate is the geometric mean.

$(1.056 \times 1.2267 \times 0.9477)^{1/3} - 1 = 7.08\%$

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

76. (B) 3

Explanation

The intervals are 30% ≤ × < 40%, 40% ≤ × < 50% ≤ × < 6%, 60% ≤ × < 70%, 70% ≤ × < 80%, and 80% ≤ × ≤ 90%. There are 3 scores in the range 80% ≤ × ≤ 90%.

(Study Session 1, Module 2.1, LOS 2.c)

Related Material

Schweser Notes - Book 1

77. (A) describes the degree to which a distribution is not symmetric about its 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.

(Study Session 1, Modules 2.5, LOS 2.m)

Related Material

Schweser Notes - Book 1

78. (B) 1.80.

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

(Study Session 1, Module 2.4, LOS 2.j)

Related Material

Schweser Notes - Book 1

79. (C) Line chart.

Explanation

A line chart is a graph used to visualize ordered observations such as data series over time. Two or more lines can appear on the same chart to show the relative changes in variables.

(Study Session 1, Module 2.2, LOS 2.e)

Related Material

Schweser Notes - Book 1

80. (A) The cumulative absolute frequency of the interval is 20.

Explanation

The cumulative absolute frequency of the fourth interval is 80, which is the sum of the absolute frequencies from the first to the fourth intervals.

For Further Reference:

(Study Session, 1 Module 2.1, LOS 2.c)

CFA® Program Curriculum, Volume 1, page 75

Related Material

Schweser Notes - Book 1

81. (B) 9.1%

Explanation

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

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

82. (C) a distribution of numerical data.

Explanation

A frequency polygon depicts the shape and range of a distribution

(Study Session 1, Module 2.2, LOS 2.e)

Related Material

Schweser Notes - Book 1

83. (A) 4.40.

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 bases on the CV, a lower value is preferred to higher.

(Study Session 1, Module 2.4, LOS 2.j)

Related Material

Schweser Notes - Book 1

84. (B) has positive excess kurtosis.

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.

(Study Session 1, Module 2.5, LOS 2.m)

Related Material

Schweser Notes - Book 1

85. (B) 60%.

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%.

(Study Session 1, Module 2.4, LOS 2.j)

Related Material

Schweser Notes - Book 1

86. (A) Daily closing prices for a stock over the past month.

Explanation

Daily closing prices for a stock are an example of structured data. Social media posts and the management discussion and analysis are examples of unstructured data, in that they consist largely of written text.

(Study Session 1, Module 2.1, LOS 2.a)

Related Material

Schweser Notes - Book 1

87. (C) higher probability of extreme upside returns and higher 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).

(Study Session 1, Module 2.5, LOS 2.m)

Related Material

Schweser Notes - Book 1

88. (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 quintiles 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 9th numbers from the left. Since L is not whole number, we interpolate as: 0.136 + (0.40) (0.139 – 0.136) = 0.1372, or 13.7%.
(Study Session 1, Module 2.4, LOS 2.i)

Related Material

Schweser Notes - Book 1

89. (B) data into non overlapping intervals

Explanation

A frequency distribution is a presentation of data grouped into non-overlapping intervals to aid the analysis of large data sets.

(Study Session 1, Modules 2.1, LOS 2.C)

Related Material

Schweser Notes - Book 1

90. (C) lower than 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 observation 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.

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1

91. (C) 23%.

Explanation

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

(Study Session 1, Module 2.4, LOS 2.i)

Related Notes

Schweser Notes - Book 1

92. (B) ordinal data.

Explanation

Ordinal data types are categorical (qualitative) data that can be ranked in logical order but cannot be subject to arithmetic operations. For example, a list of this week's 10 best-selling books does not convey by how the # 1 book outsold the #2 book.

Discrete data and continuous data are types of nominal or quantitative data. These are data types on which arithmetic operations can be performed. For example, data on cash or unit sales for this week's 10 best – selling books allow us to make statements such as "the #1 book outsold the #2 book by 10%."

(Study Session 1, Module 2.1, LOS 2.a)

Related Material

Schweser Notes - Book 1

93. (B) 10.50%

Explanation

Expected return is the weighted average of the individual expected values. The expected return is: [(5,000) x (8,000) + (10,000) x (12,000)] / 20,000= 10.50%.

(Study Session 1, Module 2.3, LOS 2.g)

Related Material

Schweser Notes - Book 1