

03

STATICAL MEASURES OF
ASSET RETURN

1. 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%.
2. 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
3. An analyst gathers the following data about the mean monthly returns of three securities:

Security	Mean Monthly Return	Standard Deviation
X	Z	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.
4. 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.

5. 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 |
6. What is the compound annual growth rate for stock A which has annual returns of 22.67%, and -5.23%?
- (A) 7.08%.
(B) 6.00%.
(C) 8.72%.
7. 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%.
8. 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%.
9. 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.

10. 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.
11. 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.
12. 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.
13. 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%.
14. 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%
15. 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.
16. 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%.

17. 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:

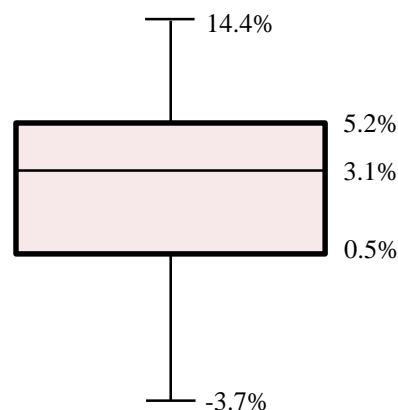
- (A) 9.1%.
- (B) 8.9%.
- (C) 9.2%.

18. 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%.

19. 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%.

20. 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.

21. 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.

22. 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%

23. 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.

24. If a distribution is positively skewed, then generally:

- (A) mean < median < mode.
- (B) mean > median < mode.
- (C) mean > median > mode.

25. 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%.
26. 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.
27. 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.
28. 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.
29. 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.
30. 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%.

31. 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.
32. 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%.
33. 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%
34. Michael Philizaire decides to calculate the geometric average of the appreciation/depreciation 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%
35. 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%.

36. 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
37. 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%.
38. 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.
- 39.
- | 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%.
40. 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.

41. 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.
42. 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
43. 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
44. 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.
45. 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.

46. 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

47. 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

48. 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.

49. 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%.

50. 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.

51. 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.

52. 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%.

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

- (A) platykurtic.
- (B) leptokurtic.
- (C) skewed..

54. 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.

55. 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.

56. 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.
57. 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.
58. 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.
59. 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%
60. 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

61. 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.

