MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

STATISTICS

Solved Examples And Exercises

1. The following are some particulars of the distribution of weights of boys and girls in a class: Boys Girls Number 100 50 Mean 60kg 45kg Variance 9 4 Which of the distributions is more variable?

▶ **Watch Video Solution**

2. For a frequency distribution mean deviation from mean in computed by $M\dot{D} = \dfrac{\sum f}{\sum f|d|}$ (b) $M\dot{D} = \dfrac{\sum d}{\sum f}$ (c) $M\dot{D} = \dfrac{\sum fd}{\sum f}$ (d) $M\dot{D} = \dfrac{\sum f|d|}{\sum f}$

> ▶ Watch Video Solution

3. Calculate mean deviation about mean from the following data: x_i : 3 9 17 23 27 f_i : 8 10 12 9 5

A. 5.09

B. 6.09

C. 7.09

D. 8.09

Answer: C

---

4. Calculate the mean deviation about median age for the age distribution of 100 persons given below: Age   16-20 21-25   26-30   31-35   36-40   41-45   46-50   51-55 Number   5   6   12   14   26   12 16   9

---

5. Calculate mean deviation from the median of the following data: Class interval: 0-6 6-12 12-18 18-24 24-30 Frequency 4 5 3 6 2

6. Find the mean deviation about the mean for the following data: Marks obtained 10-20 20-30 30-40 40-50 50-60 60-70 70-80 Number of students 2 3 8 14 8 3 2

7. Calculate the median deviation from the median of the following data: Wages per week (in Rs.), 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80 No. of workers, 4, 6, 10, 20, 10, 6, 4

8. Find the mean deviation from the mean of the following data: Classes:, 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80 frequency, 2, 3, 8, 14, 8, 3, 2

▶ **Watch Video Solution**

9. Find the mean deviation from the median for the following data: Size:, 10, 11, 12, 14, 15 Frequency:, 2, 3, 8, 3, 4

▶ **Watch Video Solution**

10. Find the mean deviation about the median of the following frequency distribution: Class:, 0-6, 6-12, 12-18, 18-24, 24-30 Frequency:, 8, 10, 12, 9, 5

11. Find the mean deviation from the mean for the following

data: Size:, 20, 21, 22, 23, 24 frequency, 6, 4, 5, 1, 4

> ▶ **Watch Video Solution**

12. Find the mean deviation from the mean for the following

data: Size: 1 3 5 7 9 11 13 15 Frequency: 3 3 4 14 7 4 3 4

> ▶ **Watch Video Solution**

13. The following table gives the number of finished articles

turned out per day be different number of workers in a

factors. Find the standard deviation of the daily output of

finished articles. Find the variance and standard deviation of the following frequency distribution: Number of article:, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27 No. of workers:, 3, 7, 11, 14, 18, 17, 13, 8, 5, 4

▶ Watch Video Solution

14. Find the mean and standard deviation of first n terms of an A.P. whose first term is a and common difference is d.

▶ Watch Video Solution

15. Find the mean: (x_i) , 2, 4, 6, 8, 10, 12, 14, 16

▶ Watch Video Solution

16. Calculate the variance and standard deviation from the data given below: Size of item, 3.5, 4.5, 5.5, 6.5, 7.5, 8.5, 9.5 Frequency , 3, 7, 22, 60, 85, 32, 8

17. Find the variance and standard deviation for the following distribution: X:, 4.5, 14.5, 24.5, 34.5, 44.5, 54.5, 64.5 $f:$, 1, 5, 12, 22, 17, 9, 4

18. Find the standard deviation for the following data: (i) $x:$, 3, 8, 13, 18, 23 $f:$, 7, 10, 15, 10, 6

19. Calculate the mean and standard deviation for the following distribution: Marks:, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80, 80-90 No. of students:, 3, 6, 13, 15, 14, 5, 4

20. Let $x_1, x_2, , x_n$ be x_n observations. Let $y_i = ax_i + b$ for i=1,2,...,n where a and b are constants. If the mean of $x_i's$ is 48 and their standard deviation is 12, the mean of $y_i's$ is 55 and standard deviation of $y_i's$ is 15, the values of a and b are

21. For a frequency distribution standard deviation is computed by applying the formula

A. $\sigma = \sqrt{\dfrac{\Sigma fd^2}{\Sigma f} - \left(\dfrac{\Sigma fd}{\Sigma f}\right)^2}$

B. $\sigma = \sqrt{\left(\dfrac{\Sigma fd}{\Sigma f}\right)^2 - \dfrac{\Sigma fd^2}{\Sigma f}}$

C. $\sigma = \sqrt{\dfrac{\Sigma fd^2}{\Sigma f} - \dfrac{\Sigma fd}{\Sigma f}}$

D. $\sigma = \sqrt{\left(\dfrac{\Sigma fd}{\Sigma f}\right)^2 - \dfrac{\Sigma fd^2}{\Sigma f}}$

Answer: A

▶ Watch Video Solution

22. The mean of 100 numbers observations is 50 and their standards deviation is 5. The sum of all squares of all the observations is

A. 50,000

B. 250,000

C. 252500

D. 255000

Answer: C

▶ **Watch Video Solution**

23. If $n = 10, X = 12$ and $\sum x_{12} = 1530,$ then the coefficient of variation is

A. 36 %

B. 41 %

C. 25 %

D. none of these

Answer: C

---

24. If the standard deviation of a variable X is σ , then standard deviation of variable $\dfrac{aX + b}{c}$ is

A. $a\sigma$

B. $\dfrac{a}{c}\sigma$

C. $\left|\dfrac{a}{c}\right|\sigma$

D. $\dfrac{a\sigma + b}{c}$

Answer: C

25. Let a, b, c, d, e, be the observations with m and standard deviation s. The standard deviation of the observations a+k, b+k, c+k, d+k, e+k is s (b) ks (c) $s + k$ (d) $\dfrac{s}{k}$

26. The lengths (in cm) of 10 rods in a shop are given below:

40.0,52.3,55.2,72.9,52.8,79.0,32.5,15.2,27.9,30.2   Find   mean deviation from median (ii) find mean deviation from the mean also.

27. If the S.D. of a set of observations is 8 and if each observation is divided by -2, the S.D. of the new set of observations will be

A. -4

B. -8

C. 8

D. 4

Answer: D

▶ **Watch Video Solution**

28. The standard deviation of the observations 6,5,9,13,12,8,10 is

(a)6 (b) $\sqrt{6}$ (c) $\dfrac{52}{7}$ (d) $\sqrt{\dfrac{52}{7}}$

29. The standard deviation of first 10 natural numbers is

A. 8.25

B. 6.5

C. 3.87

D. 2.87

Answer: D

30. The mean deviation of the data 3,10,10,4,7,10,5 from the mean is

A. 2

B. 2.57

C. 3

D. 3.57

Answer: B

▶ **Watch Video Solution**

31. While calculating eh mean and variance of 10 readings, a student wrongly used the reading of 52 for the correct

reading 25. He obtained the mean and variance as 45 and 16 respectively. Find the correct mean and the variance.

32. Mean and standard deviation of 100 observations were found to be 40 and 10 respectively. If at the time of calculation two observations were wrongly taken as 30 and 70 in place of 3 and 27 respectively. Find the correct standard deviation.

33. Calculate the mean and standard deviation for the following data: Wages upto (into Rs.) 15 30 45 60 75 90 105

120 No. of workers 12 30 65 107 157 202 222 230

34. The following table gives the distribution of income of 100 families in a village. Calculate the standard deviation:

Income Rs. 0-1000 1000-2000 2000-3000 3000-4000 4000-5000 5000-6000 No. of Families 18 26 30 12 10 4

35. Calculate the mean and standard deviation for the following table given the age distribution of a group of people: Age: 20-30 30-40 40-50 50-60 60-70 70-80 80-90 No. of persons: 3 51 122 141 130 51 2

36. The mean deviation of the numbers ,4,5,6,7 from the mean is 25Â (b) 5 (c) 1.2 (d) 0

37. A batsman scores run in 10 innings as 38,70,48,34,42,55,63,46,54 and 44. The mean deviation about mean is 8.6   (b) 6.4   (c) 10.6   (d) 7.6

38. Let $x_1, x_2, ..., x_n$ be values taken by a variable X and $y_1, y_2, ..., y_n$ be the values taken by a variable Y

such that $y_i = ax_i + b, i = 1, 2, , n$. Then,

A. $Var(Y) = a^2 Var(X)$

B. $Var(X) = a^2 Var(Y)$

C. $Var(X) = Var(X) + b$

D. none of these

Answer: A

▶ Watch Video Solution

---

39. The algebraic sum of deviations of 10 observations

measured from 16 to 7. The mean is 105   (b) 70

(c) 15.7   (d) None of these

▶ Watch Video Solution

40. Calculate the mean deviation about median from the following data: 340, 150, 210, 240, 300, 310, 320.

41. For a group of 200 candidates the mean and $S.\,D.$ were found to be 40 and 15 respectively. Later on it was found that the score 43 was misread as 34. Find the correct mean and correct $S.\,D.$

42. Find the mean deviation from the mean for the data: 6,7,10,12,13,4,8,20.

43. The scores of a batsman in ten innings are : 38,70,48,34,42,55,63,46,54,44. Find the mean deviation about the median.

44. Calculate the mean deviation about the mean of the set of first n natural numbers when n is even natural number.

45. Calculate the mean deviation about the mean of the set of first n natural numbers when n is odd natural number.

▶ **Watch Video Solution**

46. Find the variance and standard deviation for the following data:

▶ **Watch Video Solution**

47. Complete the variance and standard deviation of the following observations of marks of 5 students of a tutorial group: Marks out of 25, 8,12,13,15,22

▶ **Watch Video Solution**

48. Calculate mean deviation from the median for the following distribution: x_i: 10 15 20 25 30 35 40 45 f_i: 7 3 8 5 6 8 4 9

49. The mean deviation for n observations $x_1, x_2, \ldots\ldots\ldots, x_n$ from their mean X is given by (a) $\displaystyle\sum_{i=1}^{n} (x_i - X)$ (b) $\dfrac{1}{n}\displaystyle\sum_{i=1}^{n} (x_i - X)$ (c) $\displaystyle\sum_{i=1}^{n} (x_i - X)^2$ (d) $\dfrac{1}{n}\displaystyle\sum_{i=1}^{n} (x_i - X)^2$

50. Let $x_1, x_2, \ldots\ldots, x_n$ be n observations, and let $\bar{x}$ be their arithematic mean and σ^2 be their variance. Statement 1: Variance of $2x_1, 2x_2, \ldots\ldots, 2x_n$ is $4\sigma^2$. Statement 2: Arithmetic mean of $2x_1, 2x_2, \ldots\ldots, 2x_n$ is $4x$. (1) Statement 1 is false, statement 2 is true (2) Statement 1 is true, statement 2 is true; statement 2 is a correct explanation for statement 1 (3) Statement 1 is true, statement 2 is true; statement 2 is not a correct explanation for statement 1 (4) Statement 1 is true, statement 2 is false

▶ Watch Video Solution

51. The mean and variance of 7 observations are 8 and 16, respectively. If five of the observations are 2, 4, 10, 12, 14. Find the remaining two observations.

52. If for a sample of size 60, we have the following information $\sum x_i^2 = 18000$ and $\sum x_i^2 = 960$, then the variance is (a) 6.63 (b) 16 (c) 22 (d) 44

53. The mean and standard deviation of 20 observations are found to be 10 and 2, respectively. One rechecking, it was found that an observation 8 was incorrect. Calculate the correct mean and standard deviation in each of the following cases. (i)   If wrong item is omitted (ii)   If it is replaced by 12.

54. Consider the numbers 1,2,3,4,5,6,7,8,9,10. If 1 is added to each number, the variance of the numbers so obtained is (a) 6.5 (b) 2.87 (c) 3.87 (d) 8.25

55. If for distribution of 18 observations $\sum (x_i - 5) = 3 and \sum (x_i - 5)^2 = 43,$ find the mean and standard deviation.

56. If the men and standards deviation of 100 observations are 50 and 4 respectively. Find the sum of all the observations and the sum of their squares.

57. Let $x_1, x_2, ..., x_n$ values of variable X and let $'a'$ be non zero real number. Then prove that the variance of the observations $ax_1, ax_2, ..., ax_n$ is a^2 Var (X) . Also, find their standard deviation.

58. If two variates X and Y are connected by the relation $Y = \dfrac{aX + b}{c}$, where a, b, c are constants such that $ac < 0$, then (a) $\sigma_\gamma = \dfrac{a}{c}\sigma_X$ (b) $\sigma_\gamma = -\dfrac{a}{c}\sigma_X$ (c) $\sigma_\gamma = \dfrac{a}{c}\sigma_X + b$ (d) none of these

▶ Watch Video Solution

59. Let $x_1, x_2, x_3,$, be n values of a variable X. If these values are changed to $x_1 + a, x + 2 + a, , x_n + a$, where a in R ,` show that the variance remains unchanged.

▶ Watch Video Solution

60. If for a sample of size 60, we have the following information $\sum x_i^2 = 18000$ and $\sum x_i^2 = 960$, then the variance is (a) 6.63 (b) 16 (c) 22 (d) 44

61. Let $x_1, x_2, \ldots\ldots, x_n$ be values taken by a variable X and $y_1, y_2, \ldots\ldots\ldots, y_n$ be the values taken by a variable Y such that $y_i = ax_i + b, i = 1, 2, , n$. Then,

(a) $Var(Y) = a^2 Var(X)$

(b) $Var(X) = a^2 Var(Y)$

(c) $Var(X) = Var(X) + b$

(d) none of these

62. The sum of the squares of deviation of 10 observations from their mean 50 is 250,then coefficient of variation is

63. If the S.D. of a set of observations is 8 and if each observation is divided by -2, the S.D. of the new set of observations will be $(a) - 4$ $\qquad$ $(b) - 8$ $\qquad$ $(c)8$ $(d)4$

64. The mean deviation of the numbers 3 ,4,5,6,7 from the mean is 5 ,(a) 2,(b) 5 (c) 1.2 (d) 0

65. A batsman scores run in 10 innings as 38,70,48,34,42,55,63,46,54 and 44. The mean deviation about median is

(a)8.6

(b)6.4

(c)10.6

(d)7.6

66. Calculate mean deviation about mean from the following data:

x_i: 3,9,17,23,27,f_i: 8,10,12,9,5

67. Calculate the mean and standard deviation for the following data: Wages upto (into Rs.), 15, 30, 45, 60, 75, 90, 105, 120 No. of workers, 12, 30, 65, 107, 157, 202, 222, 230

 ▶ **Watch Video Solution**

68. The following table gives the distribution of income of 100 families in a village. Calculate the standard deviation: Income Rs., 0-1000, 1000-2000, 2000-3000, 3000-4000, 4000-5000, 5000-6000 No. of Families, 18, 26, 30, 12, 10, 4

 ▶ **Watch Video Solution**

69. While calculating eh mean and variance of 10 readings, a student wrongly used the reading of 52 for the correct reading 25. He obtained the mean and variance as 45 and 16 respectively. Find the correct mean and the variance.

70. Mean and standard deviation of 100 observations were found to be 40 and 10 respectively. If at the time of calculation two observations were wrongly taken as 30 and 70 in place of 3 and 27 respectively. Find the correct standard deviation.

71. Calculate mean deviation from the median for the following distribution: x_i: , 10, 15, 20, 25, 30, 35, 40, 45 f_i: , 7, 3, 8, 5, 6, 8, 4, 9

▶ Watch Video Solution

72. Find the variance and standard deviation for the following data:

▶ Watch Video Solution

73. Complete the variance and standard deviation of the following observations of marks of 5 students of a tutorial group: Marks out of 25:8,12,13,15,22

▶ Watch Video Solution

74. Calculate the mean deviation about the mean of the set of first n natural numbers when n is even natural number.

75. Let $x_1, x_2, x_3, ,$ be n values of a variable X. If these values are changed to $x_1 + a, x + 2 + a, , x_n + a, where a \in R,$ show that the variance remains unchanged.

76. Find the mean deviation from the mean for the data:

6,7,10,12,13,4,8,12.

77. The scores of a batsman in ten innings are : 38,70,48,34,42,55,63,46,54,44. Find the mean deviation about the median.

78. Calculate the mean deviation about median from the following data: 340, 150, 210, 240, 300, 310, 320.

79. For a group of 200 candidates the mean and S.D. were found to be 40 and 15 respectively. Later on it was found that the score 43 was misread as 34. Find the correct mean and correct S.D.

80. Calculate the mean deviation about the mean of the set of first n natural numbers when n is odd natural number.

81. Let $x_1, x_2, \ldots, x_n$ values of variable X and let $'a'$ be non zero real number. Then prove that the variance of the

observations $ax_1, ax_2, ..., ax_n$ is a^2 Var (X) . Also, find their standard deviation.

82. If for distribution of 18 observations $\sum (x_i - 5) = 3 and \sum (x_i - 5)^2 = 43,$ find the mean and standard deviation.

83. If the mean and standards deviation of 100 observations are 50 and 4 respectively. Find the sum of all the observations and the sum of their squares.

84. Find the standard deviation for the following data:

(i) $x : 3, 8, 13, 18, 23$

$f : , 7, 10, 15, 10, 6$

(ii) $x : 1, 2, 3, 4, 5, 6, 7$

$f : 4, 9, 16, 14, 11, 6, 6$

85. The mean and standard deviation of 20 observations are found to be 10 and 2, respectively. One rechecking, it was found that an observation 8 was incorrect. Calculate the correct mean and standard deviation in each of the following cases. (i)   If wrong item is omitted (ii)   If it is replaced by 12.

86. For a frequency distribution mean deviation from mean in computed by (a) $M\dot{D} = \frac{\sum f}{\sum f|d|}$ (b) $M\dot{D} = \frac{\sum d}{\sum f}$ (c) $M\dot{D} = \frac{\sum fd}{\sum f}$ (d) $M\dot{D} = \frac{\sum f|d|}{\sum f}$

87. Calculate the mean and standard deviation for the following distribution: Marks:, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80, 80-90 No. of students:, 3, 6, 13, 15, 14, 5, 4

88. Let a, b, c, d, e, be the observations with m and standard deviation s. The standard deviation of the observations a+k, b+k, c+k, d+k, e+k is s (b) ks (c) $s + k$ (d) $\dfrac{s}{k}$

89. If $n = 10, X = 12$ and sum x^{2}=1530` then the coefficient of variation is 36% (b) 41% (c) 25% (d) none of these

90. The mean deviation for n observations $x_1, x_2, \dots\dots, x_n$ from their mean X is given by (a) $\displaystyle\sum_{i=1}^{n} (x_i - X)$ (b)

$$\frac{1}{n}\sum_{i=1}^{n}(x_i - X) \text{ (c) } \sum_{i=1}^{n}(x_i - X)^2 \text{ (c) } \frac{1}{n}\sum_{i=1}^{n}(x_i - X)^2$$

91. The standard deviation of the observations 6,5,9,13,12,8,10

is

A. 6

B. $\sqrt{6}$

C. $\dfrac{52}{7}$

D. $\sqrt{\dfrac{52}{7}}$

Answer: $\sqrt{\dfrac{52}{7}}$

92. If the standard deviation of a variable X is σ , then standard deviation of variable $\dfrac{aX + b}{c}$ is

A. (a) $a\sigma$

B. (b) $\dfrac{a}{c}\sigma$

C. (c) $\left|\dfrac{a}{c}\right|\sigma$

D. (d) $\dfrac{a\sigma + b}{c}$

Answer: (c) $\left|\dfrac{a}{c}\right|\sigma$

▶ Watch Video Solution

93. The mean of 100 numbers observations is 50 and their standards deviation is 5. The sum of all squares of all the

observations is (a)50,000   (b) 250,000   (c) 252500   (d) 255000

A. (a) 50,000

B. (b) 250,000

C. (c) 252500

D. (d) 255000

Answer: (c) 252500

▶ **Watch Video Solution**

94. The following is ht record of goals scored by team A in a football session   For the team b, mean number of goals scored per match was 2 with a standard deviation 1.25 goals. Find which team may be considered more consistent?

A. 1

B. null

C. null

D. null

Answer: null

▶ Watch Video Solution

---

95. The standard deviation of first 10 natural numbers is

8.25   (b) 6.5   (c) 3.87   (d) 2.87

A. (a) 8.25

B. (b) 6.5

C. (c) 3.87

D. (d) 2.87

Answer: (d) 2.87

96. Let $x_1, x_2, , x_n$ be x_n observations. Let $y_i = ax_i + b$ for $i = 1, 2, ..., n$ where a and b are constants. If the mean of x_i is 48 and their standard deviation is 12, the mean of y_i is 55 and standard deviation of y_i is 15, the values of a and b are

A. (a) $a = 1.25, b = -5$

B. (b) $a = -1.25, b = 5$

C. (c) $a = 2.5, b = -5$

D. (d) $a = 2.5, b = 5$

Answer: (a) $a = 1.25, b = -5$

97. Let $x_1, x_2, ..., x_n$ be n observations and $\overline{X}$ be their arithmetic mean. The standard deviation is given by

A. (a) $\displaystyle\sum_{i=1}^{n} \left(x_i - \overline{X}\right)^2$

B. (b) $\displaystyle\frac{1}{n}\sum_{i=1}^{n} \left(x_i - \overline{X}\right)^2$

C. (c) $\displaystyle\sqrt{\frac{1}{n}\sum_{i=1}^{n} \left(x_i - X\right)^2}$

D. (d) $\displaystyle\frac{1}{n}\sum_{i=1}^{n} x_i^2 - \overline{X}^2$

Answer: (c) $\displaystyle\sqrt{\frac{1}{n}\sum_{i=1}^{n} \left(x_i - X\right)^2}$

98. The following are some particulars of the distribution of weights of boys and girls in a class:

Number:

Boys :100

Girls: 50

Mean weight:

Boys : $60kg$

Girls: $45kg$

Variance:

Boys: 9

Girls: 4

Which of the distributions is more variable?

99. The mean deviation of the data 3,10,10,4,7,10,5 from the

mean is (a) 2   (b) 2.57   (c)3   (d) 3.57

100. There are 60 students in a class. The following is the

frequency distribution of marks obtained by the students in

a test: Marks:, 0, 1, 2, 3, 4, 5 Frequency , $x - 2$, x , x^2 ,

$(x + 1)^2$, $2x$, $x + 1$. Determine mean and standard

deviation of the marks.

101. Find the mean deviation about median for the following data : Marks 0-10 10-20 20-30 30-40 40-50 50-60 Number of 6 8 14 16 4 2 Girls

102. The following table gives the number of finished articles turned out per day be different number of workers in a factors. Find the standard deviation of the daily output of finished articles. Find the variance and standard deviation of the following frequency distribution:

Number of article:, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27

No. of workers:, 3, 7, 11, 14, 18, 17, 13, 8, 5, 4

▶ **Watch Video Solution**

103. Calculate the mean deviation about median age for the age distribution of 100 persons given below: Age 16-20 21-25 26-30 31-35 36-40 41-45 46-50 51-55 Number 5 6 12 14 26 12 16 9

▶ **Watch Video Solution**

104. Calculate mean deviation from the median of the following data: Class interval: 0-6 6-12 12-18 18-24 24-30

Frequency 4 5 3 6 2

105. Find the mean and standard deviation of first n terms of an A.P. whose first term is a and common difference is d.

106. Find the variance and standard deviation of the following frequency distribution: Variable (x_i) , 2, 4, 6, 8, 10, 12, 14, 16 Frequency (f_i) , 4, 4, 5, 15, 8, 5, 4, 5

107. Calculate the median deviation from the median of the following data: Wages per week (in Rs.), 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80 No. of workers, 4, 6, 10, 20, 10, 6, 4

▶ **Watch Video Solution**

108. Find the mean deviation from the mean of the following data:

Classes:, 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80

freequency:2, 3, 8, 14, 8, 3, 2

▶ **Watch Video Solution**

109. Find the about the mean for the following data:

Marks obtained , 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80

Number of students, 2, 3, 8, 14, 8, 3, 2

▶ **Watch Video Solution**

110. Find the mean deviation from the mean for the following data: Size:, 20, 21, 22, 23, 24 frequency, 6, 4, 5, 1, 4

▶ **Watch Video Solution**

111. Find the mean deviation from the mean for the following data: Size: 1 3 5 7 9 11 13 15 Frequency: 3 3 4 14 7 4 3 4

112. Find the mean deviation from the median for the following data:

$$\begin{cases} \text{size:} & 10 \quad 11 \quad 12 \quad 14 \quad 15 \\ \text{frequency:} & 2 \quad 3 \quad 8 \quad 3 \quad 4 \end{cases}$$

▶ **Watch Video Solution**

113. Find the mean deviation about the median of the following frequency distribution: Class:, 0-6, 6-12, 12-18, 18-24, 24-30 Frequency:, 8, 10, 12, 9, 5

▶ **Watch Video Solution**

114. Calculate the mean and standard deviation for the following table given the age distribution of a group of people: Age: 20-30 30-40 40-50 50-60 60-70 70-80 80-90 No. of persons: 3 51 122 141 130 51 2

115. The lengths (in cm) of 10 rods in a shop are given below: 40.0,52.3,55.2,72.9,52.8,79.0,32.5,15.2,27.9,30.2   Find   mean deviation from median (ii) find mean deviation from the mean also.

116. The mean and variance of 7 observations are 8 and 16, respectively. If five of the observations are 2, 4, 10, 12, 14. Find the remaining two observations.

117. An analysis of monthly wages paid to workers in two firms A and B, belonging to the same industry, gives the following result

(i)   Which firm A or B pays larger amount as monthly wages?

(ii)   Which firm, A or B, show greater variability in individual wages?

118. From the prices of shares X and Y below, find out which is more stable in value

X	35	54	52	53	56	58	52	50	51	49
Y	108	107	105	105	106	107	104	103	104	101

119. If two variates $X and Y$ are connected by the relation $Y = \dfrac{aX + b}{c}$, $where a, b, c$ are constants such that $ac < 0$, then

(a) $\sigma_\gamma = \dfrac{a}{c}\sigma_X$ (b) $\sigma_\gamma = -\dfrac{a}{c}\sigma_X$

(c) $\sigma_\gamma = \dfrac{a}{c}\sigma_X + b$

(d) none of these

120. Calculate the variance and standard deviation from the data given below: Size of item, 3.5, 4.5, 5.5, 6.5, 7.5, 8.5, 9.5 Frequency , 3, 7, 22, 60, 85, 32, 8

121. Find the variance and standard deviation for the following distribution: X:, 4.5, 14.5, 24.5, 34.5, 44.5, 54.5, 64.5 f: , 1, 5, 12, 22, 17, 9, 4

122. Calculate the mean deviation about the median of the following observation: 3011,2780,3020,2354,3541,4150,5000

▶ Watch Video Solution

123. The scores of a batsman in ten innings are : 38,70,48,34,42,55,63,46,54,44. Find the mean deviation about the median.

▶ Watch Video Solution

124. Calculate the mean deviation about median of the following data.(i) 34, 66, 30, 38, 44, 50, 40, 60, 42, 51

▶ Watch Video Solution

125. Calculate the mean deviation about the median of the following observation:22,24,30,27,29,31,25,28,41,42

▶ **Watch Video Solution**

126. Calculate the mean deviation about the median of the following observation:38,70,48,34,63,42,55,44,53,47

▶ **Watch Video Solution**

127. Calculate the mean deviation about mean of the following data.(i) 1, 4, 7, 8, 9,10, 12, 13, 17

▶ **Watch Video Solution**

128. Calculate the mean deviation from the mean for the following data:13,17,16,14,11,13,10,16,11,18,12,17

> ▶ **Watch Video Solution**

129. Calculate the mean deviation from the mean for the following data:38,70,48,40,42,55,63,46,54,44

> ▶ **Watch Video Solution**

130. Calculate the mean deviation from the mean for the following data:36,72,46,42,60,45,53,46,51,49

> ▶ **Watch Video Solution**

131. Calculate the mean deviation from the mean for the following data:57,64,43,67,49,59,44,47,61,59

132. Calculate the mean deviation of the following income groups of five and seven members from their medians: 1st income group (in Rs.): 4000 4200 4400 4600 4800 2nd income group (in Rs.): 3800 4000 4200 4400 4600 4800 5800

133. Calculate the mean deviation from the median of the following frequency distribution:

134. Calculate the mean deviation about the median of the following frequency distribution: 5 7 9 11 13 15 17 2 4 6 8 10 12 8

135. Find the mean deviation from the mean for the following data: 5 2 9 10 12 15 8 6 2 2 2 6

136. Find the mean deviation from the median of the following data: 15 21 27 30 3 5 6 7

▶ Watch Video Solution

137. Compute the mean deviation from the median of the following distribution: Class 0-10 10-20 20-30 30-40 40-50 Frequency 5 10 20 5 10

▶ Watch Video Solution

138. Find the mean deviation from the mean for the following data: Classes 0-100 100-200 200-300 300-400 400-500 500-600 600-700 700-800 Frequencies 4 8 9 10 7 5 4 3

139. Compute mean deviation from mean of the following distribution: Marks 10-20 20-30 30-40 40-50 50-60 60-70 70-80 80-90 No. of students 8 10 15 2 20 18 9 5

▶ **Watch Video Solution**

140. Find the deviation from the mean and from median of the following distribution: Marks 0-10 10-20 20-30 30-40 40-50 No. of Students 5 8 15 16 6

▶ **Watch Video Solution**

141. Calculate the mean deviation about the mean for the following frequency distribution Class interval $0 - 4, 4 - 8, 8 - 12, 12 - 16, 16 - 20$ Frequency $4, 6, 8, 5, 2$

▶ **Watch Video Solution**

142. Let $x_1, \ x_2, \ .... \ , \ x_n$ values of variable X and let $'a'$ be non zero real number. Then prove that the variance of the observations $ax_1, \ ax_2, \ ..., \ ax_n$ is a^2 Var (X) . Also, find their standard deviation.

▶ **Watch Video Solution**

143. Calculate the mean and standard deviation of first n natural numbers.

▶ Watch Video Solution

144. Find the mean variance and standard deviation for the following data: 2,4,5,6,8,17

▶ Watch Video Solution

145. Find the mean, variance and standard deviation for the following data: 6,7,10,12,13,4,8,12

▶ Watch Video Solution

146. Find the mean, variance and standard deviation for the following data:227,235,255,269,292,299,312,321,333,348

▶ **Watch Video Solution**

147. The variance of 20 observations is 5. If each observation is multiplied by 2 find the variance of the resulting observations.

▶ **Watch Video Solution**

148. The variance of 15 observations is 4. If each observations increased by 9 find the variance of the resulting observations.

▶ **Watch Video Solution**

149. The mean of 5 observations is 4.4 and their variance is 8.24. If three of the observations are 1, 2 and 6, find the other two observations.

> ▶ **Watch Video Solution**

150. The mean and standard deviation of six observations are 8 and 4, respectively. If each observation is multiplied by 3, find the new mean and new standard deviation of the resulting observations.

> ▶ **Watch Video Solution**

151. The mean and variance of eight observations are 9 and 9.25, respectively. If six of the observations are 6, 7, 10, 12, 12 and 13, find the remaining two observations.

152. For a group of 200 candidates, mean was found to 40 but it was discovered later that the scores of 43 and 35 were misread as 34 and 53 respectively. Then the correct mean is

153. The mean and standard deviation of 100 observations were calculated as 40 and 5.1 respectively by a student who

took by mistake 50 instead of 40 for one observation. What are the correct mean and standard deviation?

154. The mean and standard deviation of 20 observations are found to be 10 and 2, respectively. One rechecking, it was found that an observation 8 was incorrect. Calculate the correct mean and standard deviation in each of the following cases.

(i)   If wrong item is omitted

(ii)   If it is replaced by 12.

155. The mean and standard deviation of a group of 100 observations were found to be 20 and 3, respectively. Later on it was found that three observations were incorrect, which are recorded as 21, 21 and 18. Find the mean and standard deviation if the incorrect observations are omitted.

156. Show that the two formulae for the standard deviation of ungrouped data: $\sigma = \sqrt{\dfrac{1}{n}\sum\left(x_i - \overline{X}\right)^2}$ and $\sigma' = \sqrt{\dfrac{1}{n}\sum x_i^2 - \overline{X}^2}$ are equivalent where $\overline{X} = \dfrac{1}{n}\sum x_i.$

157. Find the variance and standard deviation for the following distribution: X:, 4.5, 14.5, 24.5, 34.5, 44.5, 54.5, 64.5

f: , 1, 5, 12, 22, 17, 9, 4

▶ Watch Video Solution

158. Table below shows the frequency f with which x alpha particles were radiated from a diskette x: 0 1 2 3 4 5 6 7 8 9 10 11 12 f: 51 203 383 25 532 408 273 139 43 27 10 4 2 Calculate the mean and variance

▶ Watch Video Solution

159. Calculate the mean and S.D. for the following data: Expenditure (in Rs.) 0-10 10-20 20-30 30-40 40-50 Frequency:

14 13 27 21 15

160. Calculate the standard deviation for the following data:

Class 0-30 30-60 60-90 90-120 120-150 10-180 180-210

Frequency: 9 17 43 82 81 44 24

161. The mean and standard deviation of 100 observations were calculated as 40 and 5.1 respectively by a student who took by mistake 50 instead of 40 for one observation. What are the correct mean and standard deviation?

162. Calculate mean, variance and standard deviation of the following frequency distribution:

Class	Frequency
1 − 10	11
10 − 20	29
20 − 30	18
30 − 40	4
40 − 50	5

| 50 — 60 | 3 |

163. An analysis of monthly wages paid to workers in two firms A and B, belonging to the same industry, gives the following results: Firm A Firm B No. of wages earners 586 648 Mean of monthly wages Rs. 5253 Rs. 5253 Variance of the distribution of wages 100 121

(i) Which firm A or B pays to larger mount as monthly wages?

(ii) Which firm A or B shows greater variability in individual wages?

164. The following values are calculated in respect of heights and weights of the students of a section of class XI:

Height Weight Mean 162.6 cm 52.36 kg Variance 127.69cm2 23.1361 kg2 Can we say that the weights show greater variation than the heights?

165. The sum and sum of squares corresponding to length x (in cm) and weight y (in gm) of 50 plant products are given below :

$$\sum_{i=1}^{50} x_i = 212, \sum_{i=1}^{50} x_i^2 = 902.\,8, \sum_{i=1}^{50} y_i = 261, \sum_{i=1}^{50} y_i^2 = 1457.\,6$$

Which is more varying, the length or weight?

166. Two plants A and B of a factory show following results about the number of workers and the wages paid to them.

Plant A Plant B No. of workers 5000 6000 Average monthly wages Rs. 2500 Rs. 2500 Variance of distribution of wages 81 100 In which plant A or B is there greater variability in individual wages?

▶ Watch Video Solution

167. The means and standard deviations of heights ans weights of 50 students of a class are as follows: Weights Heights Mean 63.2 kg 63.2 inch Standard deviation 5.6 kg 11.5 inch Which shows more variability, heights or weights?

▶ Watch Video Solution

168. Coefficient of variation of two distributions are 60% and 70% and their standard deviations are 21 and 16 respectively. What are their arithmetic means?

169. An analysis of the weekly wages paid to workers in two firms A and B, belonging to the same industry gives the following results;   Firm A Firm B No. of wages earners 586 648 Average weekly wages Rs. 52.5 Rs. 47.5 Distribution of wages 100 121

(i) Which firm A or B pays out larger amount as weekly wages?

(ii) Which firm A or B has greater variability in individual wages?

170. The mean and standard deviation of marks obtained by 50 students of a class in there subjects, mathematics, physics and chemistry are given below: Subject Mathematics Physics Chemistry Mean 42 32 40.9 Standard Deviation 12 15 20 Which of the three subjects shows the highest variability in marks and which shows the lowest?

171. The variance of first n natural number is:

172. If the sum of the squares of deviations for 10 observations taken from their means is 2.5, then write the value of standard deviation.

173. If $x_1, x_2, , x_n$ are n values of a variable X and $y_1, y_2 y_n$ are n values of variable Y such that $y_i = ax_i + b, i = 1, 2, ; n$ then write $Var(Y)$ in terms of $Var(X)$

174. In a series of 20 observations, 10 observation each equal to k and each of the remaining half is equal to $-k$. If the

standard deviation of the observations is 2, then write the value of k.

175. If each observation of a dist., whose variance is σ^2 , is multiplied by λ, then the S.D. of the new observations is

Others

1. From the prices of shares X and Y given below: find out which is more stable value: X: 35 54 52 53 56 58 52 50 50 49

Y: 108 107 105 105 106 107 104 103 104 101

2. Suppose that samples of polythene bags from two manufacturers, A and B, are tested by a prospective buyer for bursting pressure, with the following results.

Bursting presure in kg	Number of bags manufactured by manufacturer	
	A	B
5–10	2	9
10–15	9	11
15–20	29	18
20–25	54	32
25–30	11	27
30–35	5	13

Which set of the bags has the highest average brusting pressure? Which has more uniform pressure?

3. The age distribution of 00 life-insurance policy holders is as follows: Age (on nearest birthday) 17-19.5 20-25.5 26-35.5 36-40.5 51-55.5 56-60.5 61-70.5   No. of persons 5 16 12 26 14 12 6

4. There are 60 students in a class. The following is the frequency distribution of marks obtained by the students in a test: Marks: 0 1 2 3 4 5 Frequency $x - 2$ x x^2 $(x + 1)^2$ $2x$ $x + 1$

5. The weight of coffee in 70 jars is shown in the following table: Weight (in grams):, $200 - 201$, $201 - 202$, $202 - 203$, $203 - 204$, 204-205, 205-206 $Frequency$, 13, 27, 18, 10, 1, 1 Determine the variance and standard deviation of the above distribution.

▶ View Text Solution

6. Find the mean and variance of frequency distribution given below: x_i: , $1 \leq x < 3$, $3 \leq x < 5$, $5 \leq x < 7$, $7 \leq x < 10$ f_i: , 6, 4, 5, 1

▶ View Text Solution

7. The mean deviation of the series $a, a + d, a + 2d, , a + 2n$ from its mean is $\dfrac{(n+1)d}{2n+1}$ (b) $\dfrac{nd}{2n+1}$ (c) $\dfrac{n(n+1)d}{2n+1}$ (d) $\dfrac{(2n+1)d}{n(n+1)}$

▶ View Text Solution

8. The scores of a batsman in 10 matches were as follows:

38,70,48,34,42,55,63,46,54,44 compute the variance and standard deviation.

▶ View Text Solution

9. The number of telephone calls received at an exchange in 245 successive one-minute intervals are shown in the

following frequency distribution: Number of calls, 0, 1, 2, 3, 4, 5, 6, 7 Frequency, 14, 21, 25, 43, 51, 40, 39, 12

10. Life of bulbs produced by two factories A and B are given below: Length of life (in hours):, 550-650, 650-750, 750-850, 850-950, 950-1050 Factory A: (Number of bulbs), 10, 22, 52, 20, 16 Factory B(Number of bulbs), 8, 60, 24, 16, 12

11. The measurements of the diameters (in mm) of the heads of 107 screws are given below: Diameter (in mm), 33-35, 36-38, 39-41, 42-44, 45-47 No. of screws, 10, 19, 23, 21, 27

12. Following are the marks obtained, out of 100, by two students Ravi and Hashina in 10 life?

Ravi: 25, 50, 45, 30, 70, 42, 36, 48, 35, 60

Hashina: 10, 70, 50, 20, 95, 55, 42, 60, 48, 80

Who is more intelligent and who is more consistent?

13. Consider the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

If 1 is added to each number, the variance of the numbers so obtained is

A. (a) 6.5

B. (b) 2.87

C. (c) 3.87

D. (d) 8.25

Answer: (d) 8.25

▶ **View Text Solution**

14. Calculate coefficient of variation from the following data:

Income (in Rs.)	No of families
1000 − 1700	12
1700 − 2400	18

$2400 - 3100$	20
$3100 - 3800$	2
$3800 - 4500$	35
$4500 - 5200$	10

▶ View Text Solution