ASSIGNMENT - STATISTICS

Find the mean deviation about the mean for the following data:

1. 7, 8, 4, 13, 9, 5, 16, 18
2. 39, 72, 48, 41, 43, 55, 60, 45, 54, 43
3. 17, 20, 12, 13, 15, 16, 12, 18, 15, 19, 12, 11

Find the mean deviation about the median for the following data:

4. 12, 5, 14, 6, 11, 13, 17, 8, 10
5. 4, 15, 9, 7, 19, 13, 6, 21, 8, 25, 11
6. 34, 23, 46, 37, 40, 28, 32, 50, 35, 44
7. 70, 34, 42, 78, 65, 45, 54, 48, 67, 50, 56, 63

Find the mean deviation about the mean for the following data:

8.

x_i	6	12	18	24	30	36
f_i	5	4	11	6	4	6

9.

x_i	2	5	6	8	10	12
f_i	2	8	10	7	8	5

10.

x_i	3	5	7	9	11	13
f_i	6	8	15	25	8	4

Find the mean deviation about the median for the following data:

11.

x_i	15	21	27	30	35
f_i	3	5	6	7	8

12.

x_i	5	7	9	11	13	15	17
f_i	2	4	6	8	10	12	8

13.

x_i	10	15	20	25	30	35	40	45
f_i	7	3	8	5	6	8	4	9

Find the mean deviation about the mean for the following data:

14.

Mark	0–10	10–20	20–30	30–40	40–50	50–60
Number of students	6	8	14	16	4	2

15.

Height (in cm)	95–105	105–115	115–125	125–135	135–145	145–155
Number of boys	9	16	23	30	12	10

16.

Class	30–40	40–50	50–60	60–70	70–80	80–90	90–100
Frequency	3	7	12	15	8	3	2

Find the mean deviation about the median for the following data:

17.

Class	0–10	10–20	20–30	30–40	40–50	50–60
Frequency	6	7	15	16	4	2

18.

Class	0–10	10–20	20–30	30–40	40–50	50–60
Frequency	6	8	11	18	5	2

ANSWERS

1. Find the mean, variance and standard deviation for the numbers 4, 6, 10, 12, 7, 8, 13, 12.
2. Find the mean, variance and standard deviation for first six odd natural numbers.

Using short cut method, find the mean, variance and standard deviation for the data:

3.

x_i	4	8	11	17	20	24	32
f_i	3	5	9	5	4	3	1

4.

x_i	6	10	14	18	24	28	30
f_i	2	4	7	12	8	4	3

5.

x_i	10	15	18	20	25
f_i	3	2	5	8	2

6.

x_i	92	93	97	98	102	104	109
f_i	3	2	3	2	6	3	3

7.

Class	0–10	10–20	20–30	30–40	40–50
Frequency	5	8	15	16	6

8.

Class	30–40	40–50	50–60	60–70	70–80	80–90	90–100
Frequency	3	7	12	15	8	3	2

9.

Class	25–35	35–45	45–55	55–65	65–75
Frequency	64	132	153	140	51

ANSWERS

1. Mean = 9, Variance = 9.25 and SD = 3.04
2. Mean = 6, Variance = 11.67 and SD 3.41
3. Mean = 14, Variance = 45.8 and SD = 6.77
4. Mean = 19, Variance = 43.4 and SD = 6.59
5. Mean = 18, Variance = 17 and SD = 4.12
6. Mean = 100, Variance = 29.09 and SD = 5.39
7. Mean = 27, Variance = 132 and SD = 11.49
8. Mean = 62, Variance = 201 and SD 14.17
9. Mean = 49.67, Variance = 135.44 and SD = 11.64

ASSIGNMENT – LINEAR INEQUALITY

1. Fill in the blanks with correct inequality sign ($>, <, \geq, \leq$).
   - (i) $5x < 20 \Rightarrow x \ldots\ldots 4$
   - (ii) $-3x > 9 \Rightarrow x \ldots\ldots -3$
   - (iii) $4x > -16 \Rightarrow x \ldots\ldots -4$
   - (iv) $-6x \leq -18 \Rightarrow x \ldots\ldots 3$
   - (v) $x > -3 \Rightarrow -2x \ldots\ldots 6$
   - (vi) $a < b$ and $c < 0 \Rightarrow \dfrac{a}{c} \ldots\ldots \dfrac{b}{c}$
   - (vii) $p - q = -3 \Rightarrow p \ldots\ldots q$
   - (viii) $u - v = 2 \Rightarrow u \ldots\ldots v$

Solve each of the following inequations and represent the solution set on the number line.

2. $6x \leq 25$, where (i) $x \in N$, (ii) $x \in Z$.
3. $-2x > 5$, where (i) $x \in Z$, (ii) $x \in R$.
4. $3x + 8 > 2$, where (i) $x \in Z$, (ii) $x \in R$.
5. $5x + 2 < 17$, where (i) $x \in Z$, (ii) $x \in R$.

6. $3x - 4 > x + 6$, where $x \in R$.
7. $3 - 2x \geq 4x - 9$, where $x \in R$.
8. $\dfrac{5x - 8}{3} \geq \dfrac{4x - 7}{2}$, where $x \in R$.
9. $\dfrac{5x}{4} - \dfrac{4x - 1}{3} > 1$, where $x \in R$.
10. $\dfrac{1}{4}\left(\dfrac{2}{3}x + 1\right) \geq \dfrac{1}{3}(x - 2)$, where $x \in R$.
11. $\dfrac{2x - 1}{12} - \dfrac{x - 1}{3} < \dfrac{3x + 1}{4}$, where $x \in R$.
12. $\dfrac{x}{4} < \dfrac{(5x - 2)}{3} - \dfrac{(7x - 3)}{5}$, where $x \in R$.
13. $\dfrac{(2x - 1)}{3} \geq \dfrac{(3x - 2)}{4} - \dfrac{(2 - x)}{5}$, where $x \in R$.

Solve:

14. $\dfrac{x - 3}{x + 1} < 0,\ x \in R$
15. $\dfrac{x - 3}{x + 4} > 0,\ x \in R$
16. $\dfrac{2x - 3}{3x - 7} > 0,\ x \in R$
17. $\dfrac{x - 7}{x - 2} \geq 0,\ x \in R$
18. $\dfrac{3}{x - 2} > 2,\ x \in R$
19. $\dfrac{1}{x - 1} \leq 2,\ x \in R$
20. $\dfrac{5x + 8}{4 - x} < 2,\ x \in R$
21. $|3x - 7| > 4,\ x \in R$
22. $|5 - 2x| \leq 3,\ x \in R$
23. $|4x - 5| \leq \dfrac{1}{3},\ x \in R$
24. $\dfrac{1}{|x| - 3} \leq \dfrac{1}{2},\ x \in R$
25. $\dfrac{|x + 2| - x}{x} < 2,\ x \in R$
26. $\left|\dfrac{2x - 1}{x - 1}\right| > 2,\ x \in R$
27. $\dfrac{|x - 3|}{x - 3} > 0,\ x \in R$
28. $\dfrac{|x| - 1}{|x| - 2} \geq 0,\ x \in R - \{-2, 2\}$
29. $\dfrac{1}{2 - |x|} \geq 1,\ x \in R - \{-2, 2\}$
30. $|x + 1| + |x| > 3,\ x \in R$
31. $\left|\dfrac{2}{x - 4}\right| > 1,\ x \neq 4$

Solve the following systems of linear inequations:

32. $\dfrac{4}{x + 1} \leq 3 \leq \dfrac{6}{x + 1},\ x > 0$
33. $-11 \leq 4x - 3 \leq 13$
34. $5x - 7 < 3(x + 3),\ 1 - \dfrac{3x}{2} \geq x - 4$
35. $-2 < \dfrac{6 - 5x}{4} < 7$
36. $3x - 2 > x + \dfrac{4 - x}{3} > 3$
37. $\dfrac{7x - 1}{2} < -3,\ \dfrac{3x + 8}{5} + 11 < 0$
38. $-12 < 4 - \dfrac{3x}{-5} \leq 2$
39. $1 \leq |x - 2| \leq 3$

40. Find all pairs of consecutive odd positive integers, both of which are smaller than 18 such that their sum is more than 20.
41. Find all pairs of consecutive even positive integers both of which are larger than 8 such that their sum is less than 25.
42. A company manufactures cassettes. Its cost and revenue functions are $C(x) = 26000 + 30x$ and $R(x) = 43x$ respectively, where x is the number of cassettes produced and sold in a week. How many cassettes must be sold by the company to realise some profit?
43. The water acidity in a pool is considered normal when the average pH reading of three daily measurements is between 8.2 and 8.5. If the first two pH readings are 8.48 and 8.35, find the range of the pH values for the third reading that will result in the acidity level being normal.
44. A manufacturer has 640 litres of a 8% solution of boric acid. How many litres of a 2% boric acid solution be added to it so that the boric acid content in the resulting mixture will be more than 4% but less than 6%?
45. How many litres of water will have to be added to 600 litres of the 45% solution of acid so that the resulting mixture will contain more than 25%, but less than 30% acid content?
46. To receive grade A in a course one must obtain an average of 90 marks or more in five papers, each of 100 marks. If Tanvy scored 89, 93, 95 and 91 marks in first four papers, find the minimum marks that she must score in the last paper to get grade A in the course.

ANSWERS

1. (i) < (ii) < (iii) > (iv) ≥ (v) < (vi) > (vii) < (viii) >
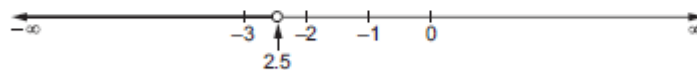2. (i) {1, 2, 3, 4}

   (ii) {..., –3, –2, –1, 0, 1, 2, 3, 4}

3. (i) {–3, –4, –5, –6, ...}
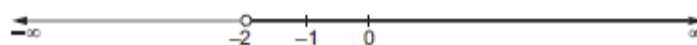

   (ii) $(-\infty, -2.5)$

4. (i) {–1, 0, 1, 2, 3, 4, ...}

   (ii) $(-2, \infty)$

5. (i) {2, 1, 0, −1, −2, …}
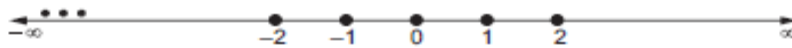
(ii) (−∞, 3)
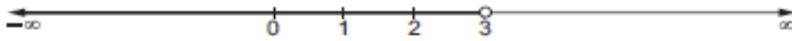
6. (5, ∞)
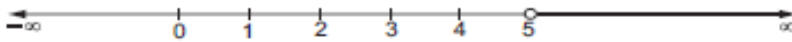
7. (−∞, 2]
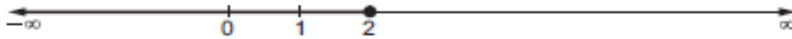
8. $\left(-\infty, \dfrac{5}{2}\right]$

9. (−∞, −8)
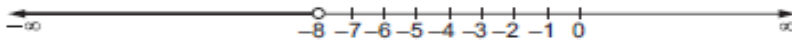
10. (−∞, 5.5]
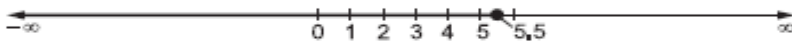
11. (0, ∞)
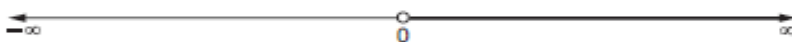
12. (4, ∞)
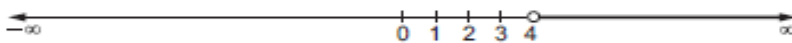
13. (−∞, 2]
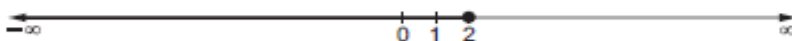
14. (−1, 3)

15. (−∞, −4) ∪ (3, ∞)

16. $\left(-\infty, \dfrac{3}{2}\right) \cup \left(\dfrac{7}{3}, \infty\right)$

17. (−∞, 2) ∪ [7, ∞)

18. $\left(2, \dfrac{7}{2}\right)$

19. $(-\infty, 1) \cup \left[\dfrac{3}{2}, \infty\right)$

20. (−∞, 0) ∪ (4, ∞)

21. $(-\infty, 1) \cup \left(\dfrac{11}{3}, \infty\right)$

22. [1, 4]

23. $\left[\dfrac{7}{6}, \dfrac{4}{3}\right]$

24. (−∞, −5] ∪ (−3, 3) ∪ [5, ∞)

25. (−∞, −2) ∪ (1, ∞)

26. $\left(\dfrac{3}{4}, 1\right) \cup (1, \infty)$

27. (3, ∞)

28. [−1, 1] ∪ (−∞, −2) ∪ (2, ∞)

29. (−2, −1] ∪ [1, 2)

30. (−∞, −2) ∪ (1, ∞)

31. (2, 4) ∪ (4, 6)

32. $\dfrac{1}{3} \le x \le 1$

33. −2 ≤ x ≤ 4

34. −∞ < x ≤ 2

35. −4.4 < x < 2.8

36. $\dfrac{5}{2} < x < \infty$

37. −∞ < x < −21

38. $\dfrac{-80}{3} < x \le \dfrac{-10}{3}$

39. [−1, 1] ∪ [3, 5]

40. (11, 13), (13, 15), (15, 17)

41. (10, 12)

42. More than 2000

43. Between 7.77 and 8.67

44. More than 320 litres and less than 1280 litres

45. More than 300 litres but less than 480 litres

46. 82 marks