Exercise 24.3   Page No: 24.18

Question 1: Find the median of the following data:

83 , 37 , 70 , 29 , 45 , 63 , 41 , 70 , 34 , 54

Solution:

Arranging given numbers in ascending order:

29 , 34 , 37 , 41 , 45 , 54 , 63 , 70 , 70 , 83

Here, Total number of terms = n = 10 (even)

$$\therefore median = \frac{\frac{n}{2}th\ value + \left(\frac{n}{2}+1\right)th\ value}{2}$$

$$= \frac{\frac{10}{2}th\ value + \left(\frac{10}{2}+1\right)th\ value}{2}$$

$$= \frac{5th\ value + 6th\ value}{2}$$

$$= \frac{45+54}{2}$$

$$= \frac{99}{2} = 49.5$$

Question 2: Find the median of the following data:
133 , 73 , 89 , 108 , 94 , 104 , 94 , 85 , 100 , 120

Solution:

Arranging given numbers in ascending order:

73 , 85 , 89 ,94 , 94 , 100 , 104 , 108 , 120 , 133

Here, total number of terms = n = 10 (even)

$$\therefore median = \frac{\frac{n}{2}th\ value + \left(\frac{n}{2}+1\right)th\ value}{2}$$

$$= \frac{\frac{10}{2}th\ value + \left(\frac{10}{2}+1\right)th\ value}{2}$$

$$= \frac{5th\ value + 6th\ value}{2}$$

$$= \frac{94+100}{2}$$

$$= \frac{194}{2} = 97$$

Question 3: Find the median of the following data:
31 , 38 , 27 , 28 , 36 , 25 , 35 , 40

Solution:

Arranging given numbers in ascending order

25 , 27 , 28 , 31 , 35 , 36 , 38 , 40

Here, total number of terms = n = 8 (even)

$$\therefore median = \frac{\frac{n}{2}th\ value + \left(\frac{n}{2}+1\right)th\ value}{2}$$

$$= \frac{\frac{8}{2}th\ value + \left(\frac{8}{2}+1\right)th\ value}{2}$$

$$= \frac{4th\ value + 5th\ value}{2}$$

$$= \frac{31+35}{2}$$

$$= \frac{66}{2} = 33$$

Question 4: Find the median of the following data:
15 , 6 , 16 , 8 , 22 , 21 , 9 , 18 , 25

Solution:
Arranging given numbers in ascending order
6 , 8 , 9 , 15 , 16 , 21 , 22 , 25

Here, total number of terms = n = 9 (odd)

$$\therefore Median = \left(\frac{n+1}{2}\right) th \text{ term}$$

$$= \left(\frac{9+1}{2}\right) th \text{ term}$$

$$= 5th \text{ term} = 16$$

Question 5: Find the median of the following data:
41 , 43 , 127 , 99 , 71 , 92 , 71 , 58 , 57

Solution:
Arranging given numbers in ascending order
41 , 43 , 57 , 58 , 71 , 71 , 92 , 99 , 127

Here, total number of terms = n = 9 (odd)

$$\therefore Median = \left(\frac{n+1}{2}\right) th \text{ term}$$

$$= \left(\frac{9+1}{2}\right) th \text{ term}$$

$$= 5th \text{ term} = 71$$

Question 6: Find the median of the following data:
25 , 34 , 31 , 23 , 22 , 26 , 35 , 29 , 20 , 32

Solution:
Arranging given numbers in ascending order
20 , 22 , 23 , 25 , 26 , 29 , 31 , 32 , 34 , 35

Here, total number of terms = n = 10 (even)

$$\therefore median = \frac{\frac{n}{2}th\ value + \left(\frac{n}{2}+1\right)th\ value}{2}$$

$$= \frac{\frac{10}{2}th\ value + \left(\frac{10}{2}+1\right)th\ value}{2}$$

$$= \frac{5th\ value + 6th\ value}{2}$$

$$= \frac{26+29}{2}$$

$$= \frac{55}{2} = 27.5$$

Question 7: Find the median of the following data:
12 , 17 , 3 , 14 , 5 , 8 , 7 , 15

Solution:
Arranging given numbers in ascending order
3 , 5 , 7 , 8 , 12 , 14 , 15 , 17

Here, total number of terms = n = 8(even)

$$\therefore median = \frac{\frac{n}{2}th\ value + \left(\frac{n}{2}+1\right)th\ value}{2}$$

$$= \frac{\frac{8}{2}th\ value + \left(\frac{8}{2}+1\right)th\ value}{2}$$

$$= \frac{4th\ value + 5th\ value}{2}$$

$$= \frac{8+12}{2}$$

$$= \frac{20}{2} = 10$$

Question 8: Find the median of the following data:
92 , 35 , 67 , 85 , 72 , 81 , 56 , 51 , 42 , 69

Solution:
Arranging given numbers in ascending order

35 , 42 , 51 , 56 , 67 , 69 , 72 , 81 , 85 , 92

Here, total number of terms = n = 10(even)

$$\therefore median = \frac{\frac{n}{2}th\ value + \left(\frac{n}{2} + 1\right)th\ value}{2}$$

$$= \frac{\frac{10}{2}th\ value + \left(\frac{10}{2} + 1\right)th\ value}{2}$$

$$= \frac{5th\ value + 6th\ value}{2}$$

$$= \frac{67 + 69}{2}$$

$$= \frac{136}{2} = 68$$