Find the median of the following data (1 – 8)
1. 83, 37, 70, 29, 45, 63, 41, 70, 34, 54

Solution:
First we have to arrange given data into ascending order,
29, 34, 37, 41, 45, 54, 63, 70, 70, 83
Given number of observations, n = 10 (even)
Therefore median = (n/2)th term + ((n + 1)/2)th term
Median = (value of 5th term + value of 6th term)/2
= (45 + 54)/2
= 49.5
Hence median for given data = 49.5

2. 133, 73, 89, 108, 94,104, 94, 85, 100, 120

Solution:
First we have to arrange given data into ascending order,
73, 85, 89, 94, 100, 104, 108, 120, 133
Given number of observations, n = 10 (even)
Therefore median = (n/2)th term + ((n + 1)/2)th term
Median = (value of 5th term + value of 6th term)/2
= (94 + 100)/2
= 97
Hence median for given data = 97

3. 31, 38, 27, 28, 36, 25, 35, 40

Solution:
First we have to arrange given data into ascending order
25, 27, 28, 31, 35, 36, 38, 40
Given number of observations, n = 8 (even)
Therefore median = (n/2)th term + ((n + 1)/2)th term
Median = (value of 4th term + value of 5th term)/2
= (31 + 35)/2

= 33
Hence median for given data = 33

4. 15, 6, 16, 8, 22, 21, 9, 18, 25

Solution:
First we have to arrange given data into ascending order
6, 8, 9, 15, 16, 18, 21, 22, 25
Given number of observations, n = 9 (odd)
Therefore median = $((n+1)/2)^{th}$ term
Median = value of 5th term
= 16

5. 41, 43,127, 99, 71, 92, 71, 58, 57

Solution:
First we have to arrange given data into ascending order
41, 43, 57, 58, 71, 71, 92, 99, 127
Given number of observations, n = 9 (odd)
Therefore median = $((n+1)/2)^{th}$ term
Median = value of 5th term
= 71

6. 25, 34, 31, 23, 22, 26, 35, 29, 20, 32

Solution:
First we have to arrange given data into ascending order,
20, 22, 23, 25, 26, 29, 31, 32, 34, 35
Given number of observations, n = 10 (even)
Therefore median = $(n/2)^{th}$ term + $((n + 1)/2)^{th}$ term
Median = (value of 5th term + value of 6th term)/2
= (26 + 29)/2
= 27.5
Hence median for given data = 27.5

7. 12, 17, 3, 14, 5, 8, 7, 15

Solution:
First we have to arrange given data into ascending order,
3, 5, 7, 8, 12, 14, 15, 17
Given number of observations, n = 8 (even)
Therefore median = $(n/2)^{th}$ term + $((n +1)/2)^{th}$ term
Median = (value of 4th term + value of 5th term)/2
= (8 + 12)/2
= 10
Hence median for given data = 10

8. 92, 35, 67, 85, 72, 81, 56, 51, 42, 69

Solution:
First we have to arrange given data into ascending order,
35, 42, 51, 56, 67, 69, 72, 81, 85, 92
Given number of observations, n = 10 (even)
Therefore median = $(n/2)^{th}$ term + $((n + 1)/2)^{th}$ term
Median = (value of 5th term + value of 6th term)/2
= (67 + 69)/2
= 68
Hence median for given data = 68

9. Numbers 50, 42, 35, 2x +10, 2x – 8, 12, 11, 8, 6 are written in descending order and their median is 25, find x.

Solution:
Here, the number of observations n is 9.
Since n is odd, the median is the n+12th observation, i.e., the 5th observation.
As the numbers are arranged in the descending order, we therefore observe from the last.
Median = 5th observation.
=> 25 = 2x – 8
=> 2x = 25 + 8
=> 2x = 33
=> x = (33/2)
x = 16.5

10. Find the median of the following observations: 46, 64, 87, 41, 58, 77, 35, 90, 55, 92, 33. If 92 is replaced by 99 and 41 by 43 in the above data, find the new median?

Solution:
Arranging the given data in ascending order, we have:
33, 35, 41, 46, 55, 58, 64, 77, 87, 90, 92
Here, the number of observations n is 11 (odd).
Since the number of observations is odd, therefore,
Therefore median = $((n+1)/2)^{th}$ term
Median = value of 5th term
= 58.
Hence, median = 58.
If 92 is replaced by 99 and 41 by 43, then the new observations arranged in ascending order are:
33, 35, 43, 46, 55, 58, 64, 77, 87, 90, 99
New median = Value of the 6th observation = 58.

11. Find the median of the following data: 41, 43, 127, 99, 61, 92, 71, 58, 57, If 58 is replaced by 85, what will be the new median?

Solution:
Arranging the given data in ascending order, we have:
41, 43, 57, 58, 61, 71, 92, 99,127
Here, the number of observations, n, is 9(odd).
Therefore median = $((n+1)/2)^{th}$ term
Median = value of 5th term
Hence, the median = 61.
If 58 is replaced by 85, then the new observations arranged in ascending order are:
41, 43, 57, 61, 71, 85, 92, 99, 12
New median = Value of the 5th observation = 71.

12. The weights (in kg) of 15 students are: 31, 35, 27, 29, 32, 43, 37, 41, 34, 28, 36, 44, 45, 42, 30. Find the median. If the weight 44 kg is replaced by 46 kg and 27 kg by 25 kg, find the new median.

Solution:
Arranging the given data in ascending order, we have:

27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 41, 42, 43, 44, 45
Here, the number of observations n is 15(odd).
Since the number of observations is odd, therefore,
Therefore median = $((n+1)/2)^{th}$ term
Median = value of 8th term
Hence, median = 35 kg.
If 44 kg is replaced by 46 kg and 27 kg by 25 kg, then the new observations arranged in ascending order are:
25, 28, 29, 30, 31, 32, 34, 35, 36, 37, 41, 42, 43, 45, 46
∴ New median = Value of the 8th observation = 35 kg.

13. The following observations have been arranged in ascending order. If the median of the data is 63, find the value of x: 29, 32, 48, 50, x, x + 2, 72, 78, 84, 95

Solution:
Here, the number of observations n is 10. Since n is even,
Therefore median = $(n/2)^{th}$ term + $((n + 1)/2)^{th}$ term
Median = (value of 5th term + value of 6th term)/2
63 = x + (x + 2)/2
63 = (2x + 2)/2
63 = 2 (x + 1)/2
63 = x + 1
x = 63 – 1
x = 62