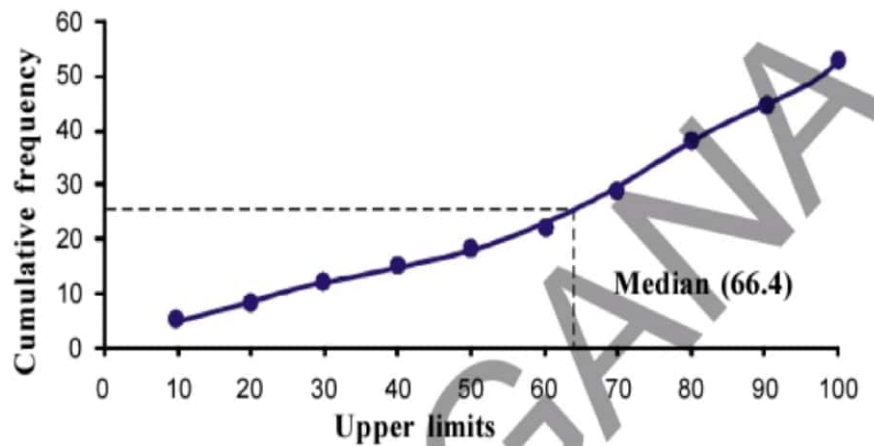


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**OBTAINING MEDIAN FROM A GIVEN CURVE:**

Is it possible to obtain the median from these two cumulative frequency curves . Let us see.

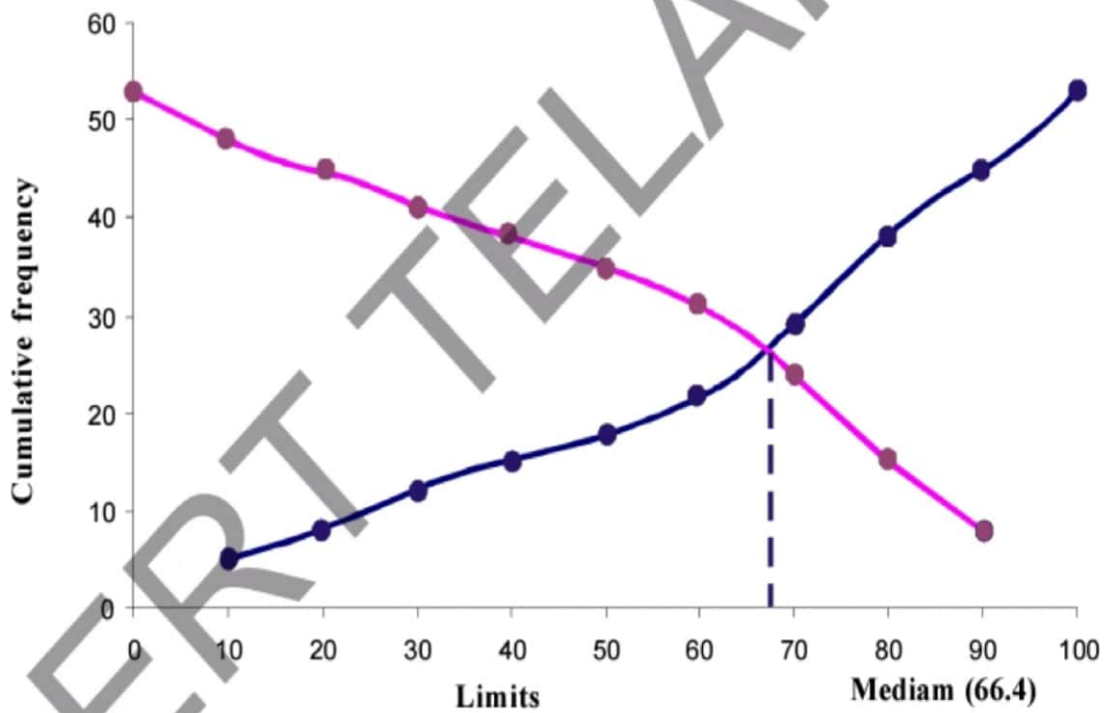
One obvious way is to locate on  $\frac{n}{2} = \frac{53}{2} = 26.5$  on the y-axis. From this point, draw a line parallel to the X-axis cutting the curve at a point. From this point, draw a perpendicular to the X-axis. Foot of this perpendicular determines the median of the data.



**Another way of obtaining the median :**

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Draw both ogives (i.e., of the less than type and of the more than type) on the same axis. The two ogives will intersect each other at a point. From this point, if we draw a perpendicular on the x-axis, the point at which it cuts the x-axis gives us the median.

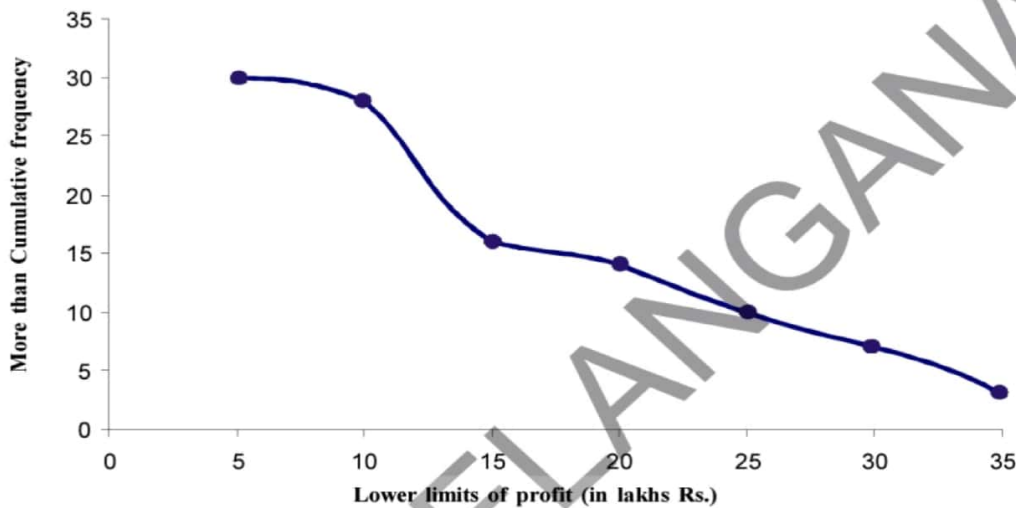


**Example-9.** The annual profits earned by 30 shops in Sangareddy locality give rise to the following distribution :

Profit (in lakhs)	Number of shops (frequency)
More than or equal to 5	30
More than or equal to 10	28
More than or equal to 15	16
More than or equal to 20	14
More than or equal to 25	10
More than or equal to 30	7
More than or equal to 35	3

Draw both ogives for the data above. Hence obtain the median profit.

**Solution :** We first draw the coordinate axes, with lower limits of the profit along the horizontal axis, and the cumulative frequency along the vertical axes. Then, we plot the points (5, 30), (10, 28), (15, 16), (20, 14), (25, 10), (30, 7) and (35, 3). We join these points with a smooth curve to get the more than ogive, as shown in the figure below-

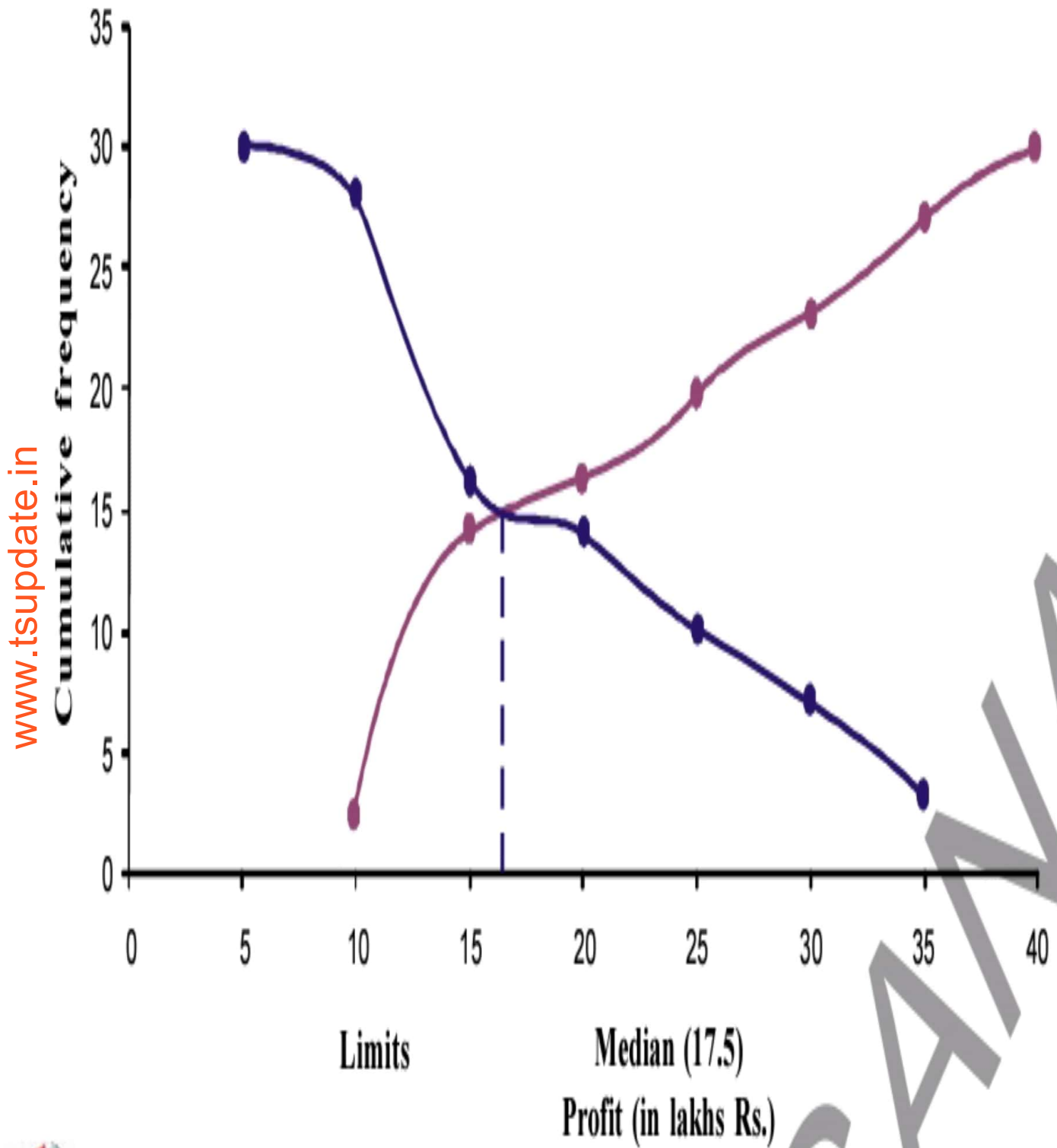


Now, let us obtain the classes, their frequencies and the cumulative frequency from the table above.

Classes	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Number of shops	2	12	2	4	3	4	3
Cumulative frequency	2	14	16	20	23	27	30

Using these values, we plot the points (10, 2), (15, 14), (20, 16), (25, 20), (30, 23), (35, 27), (40, 30) on the same axes as in last figure to get the less than ogive, as shown in figure below.

The abscissa of their point of intersection is nearly 17.5, which is the median. This can also be verified by using the formula. Hence, the median profit (in lakhs) is ₹ 17.5.



1. The following distribution gives the daily income of 50 workers of a factory.

Daily income (in Rupees)	250-300	300-350	350-400	400-450	450-500
Number of workers	12	14	8	6	10

Convert the distribution above to a less than type cumulative frequency distribution, and draw its ogive.

2. During the medical check-up of 35 students of a class, their weights were recorded as follows :

Weight (in kg)	Number of students
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

Draw a less than type ogive for the given data. Hence obtain the median weight from the graph and verify the result by using the formula.

3. The following table gives production yield per hectare of wheat of 100 farms of a village.

Production yield (Qui/Hec)	50-55	55-60	60-65	65-70	70-75	75-80
Number of farmers	2	8	12	24	38	16

Change the distribution to a more than type distribution, and draw its ogive.