

### Answer on Question #77084 – Math – Statistics and Probability

A quality audit of a bottling company showed the number of defective batches outside of the specification limits for a particular oil product. The grouped data shown in the table below indicates the number of defective items per unit of measurement.

	f
20-25	1
25-30	2
30-35	8
35-40	5
40-45	3
45-50	1

1. Complete the table data under the given columns.

#### Solution

CLASS LIMITS     $f$     CUM  $f$     CLASS MARK( $X$ )     $Xf$      $X - \bar{X}$      $(X - \bar{X})^2$

Class Limits	$f$	Relative Frequency	Midpoints ( $x$ )	$fx$	$x - \bar{x}$	$(x - \bar{x})^2$	$f(x - \bar{x})^2$
20-25	1	0.05	22.5	22.5	-12.5	156.25	156.25
25-30	2	0.1	27.5	55	-7.5	56.25	112.5
30-35	8	0.4	32.5	260	-2.5	6.25	50
35-40	5	0.25	37.5	187.5	2.5	6.25	31.25
40-45	3	0.15	42.5	127.5	7.5	56.25	168.75
45-50	1	0.05	47.5	47.5	12.5	156.25	156.25
Sum	20	1	210	700	0	437.5	675

$$\text{Midpoint of interval} = \frac{1}{2}(\text{lower class limit} + \text{upper class limit})$$

2. Calculate the mean value.

**Solution.**

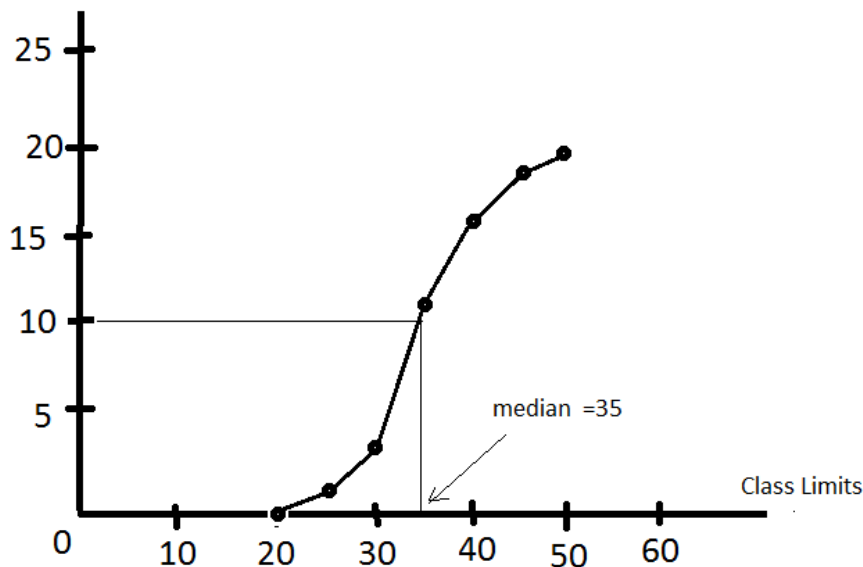
$$\bar{x} = \frac{\text{Sum of } fx}{\text{Sum of } f} = \frac{700}{20} = 35$$

3. Draw the cumulative frequency polygon and then use your graph to determine the median.

**Solution**

Class Limits	f	Cumulative Frequency
20-25	1	1
25-30	2	3
30-35	8	11
35-40	5	16
40-45	3	19
45-50	1	20

Cumulative Frequency



Using the graph, the median (the middle term in the arranged data set) is 35

We can find it as value on the Class Limits axis for the half of range of Cumulative Frequency (in our case this is  $20/2 = 10$ ).

4. Use the values from 2. and 3. to comment on the nature of the distribution. Give a reason for your answer.

**Answer:** based on the value of mean and the cumulative frequency polygon, we can assume that the distribution is normal because it is symmetric around its mean.

Answer provided by <https://www.AssignmentExpert.com>