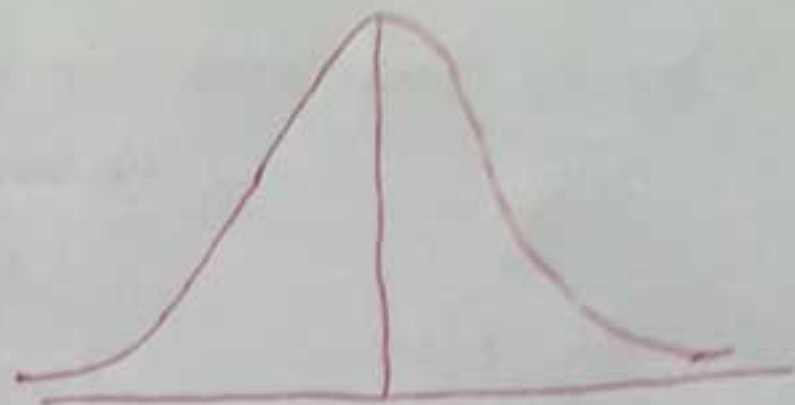


Skewness :->

Case I :-> The frequencies are symmetrically distributed about mean i.e., variates equidistant from the mean have equal frequencies. Also, the mean, mode and median coincide and median lies half-way between the two quartiles. Thus, $M = M_0 = M_d$ and $Q_3 - M = M - Q_1$.



$M = \text{Mean}$
 $M_0 = \text{Mode}$
 $M_d = \text{Median}$

\Rightarrow Symmetrical curve.

\Rightarrow Median lies half-way between the two quartiles.

Meaning of Skewness :- Skewness indicates whether the curve is turned more to one side than to other i.e., whether the curve has a longer tail on one side. Skewness can be positive as well as negative.

Test of Skewness

① If Mean = Mode = Median

Result = No Skewness.

[From Fig-1]

② If Mean < Mode

[Tail would be in the

left side] Then the distribution

is negatively skewed. from

Fig. 3

③ If Mean > Mode

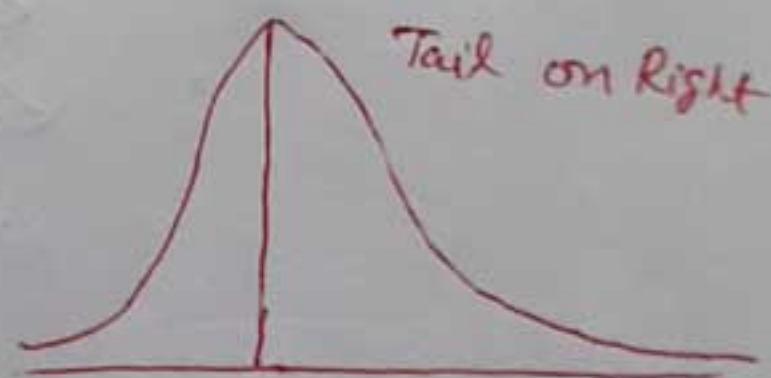
[Tail would be in the

right side.] Then the

distribution is positively skewed

From Fig-2

Fig-2



Positively Skewed Distribution

Tail on Left



Negatively Skewed Distribution

Fig-3

Karl Pearson's Coefficient of Skewness: \rightarrow denoted by

$$Skp. = \frac{\text{Mean} - \text{Mode}}{S.D.} = \frac{3(\text{Mean} - \text{Median})}{S.D.}$$

By putting $\text{Mode} = 3\text{Median} - 2\text{Mean}$

There are three cases arise:

① If $Skp = 0 \Leftrightarrow \frac{\text{Mean} - \text{Mode}}{S.D.} = 0$

$\Leftrightarrow \text{Mean} = \text{Mode}$

\Leftrightarrow Distribution is Symmetrical

② If $Skp > 0 \Leftrightarrow \frac{\text{Mean} - \text{Mode}}{S.D.} > 0$

$\Leftrightarrow \text{Mean} - \text{Mode} > 0$

$\Leftrightarrow \text{Mean} > \text{Mode}$

\Leftrightarrow Distribution is Positively Skewed.

③ If $Skp < 0 \Leftrightarrow \frac{\text{Mean} - \text{Mode}}{S.D.} < 0$

$\Leftrightarrow \text{Mean} - \text{Mode} < 0 \Leftrightarrow \text{Mean} < \text{Mode}$

\Leftrightarrow Distribution is negatively Skewed.

Question: \rightarrow For a Moderately Skewed data, the arithmetic mean is 100, the Variance is 35 and Karl Pearson's coefficient of Skewness is 0.2. Find its mode and median.

Solution \rightarrow on Page No. 9