

Skewness

When a Series is not Symmetrical it is called asymmetrical or Skewed.

Study → departure from symmetry

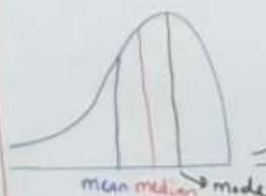
Symmetrical Distribution

② $\text{mean} = \text{median} = \text{mode}$

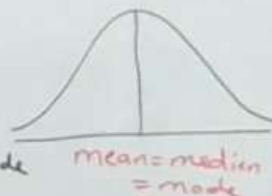
Asymmetrical Distribution

Types <
 Positively skewed
 Negatively skewed

$\text{mode} > \text{median} > \text{mean}$

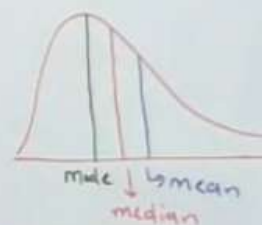


① Negatively skewed



②

$\text{mean} > \text{median} > \text{mode}$



③ Positively skewed

Measure of skewness

① Karl Pearson's measure of skewness

Absolute

$\text{Skp} = \pm 1$

$\text{Skp} = 0$

No skewness

Relative

Coefficient of

$\text{Skp} = \text{mean} - \text{mode}$

If mode is ill-defined

$\text{mode} = 3\text{median} - 2\text{mean}$

$\text{Skp} = 3\text{mean} - 3\text{median}$

$\text{Skp} = \frac{\text{mean} - \text{mode}}{\text{S.D.}}$

If mode is ill-defined.

$\text{Skp} = \frac{3\text{mean} - 3\text{median}}{\text{S.D.}}$

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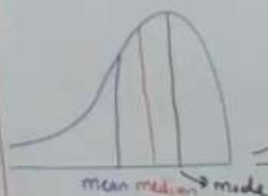
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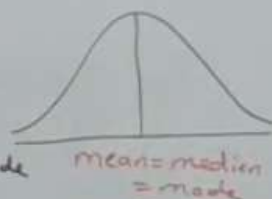
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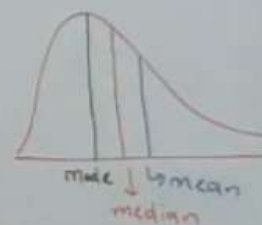


① Negatively skewed



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$\text{mean} > \text{median} > \text{mode}$



③ Positively skewed

Measure of skewness

② Bowley's skewness [based on quartiles]



± 1

$$\text{median} - Q_1 = Q_3 - \text{median}$$

Absolute

$$\text{SkB} = Q_3 + Q_1 - 2\text{median}$$

Relative

$$\text{SkRB} = \frac{Q_3 + Q_1 - 2\text{median}}{Q_3 - Q_1}$$

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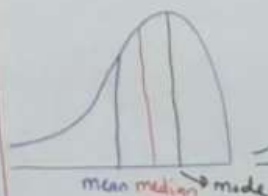
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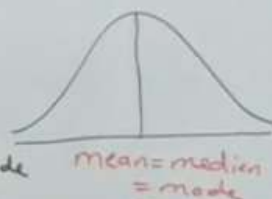
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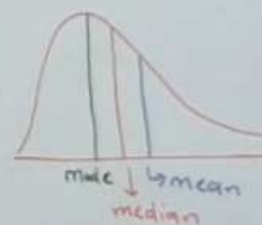


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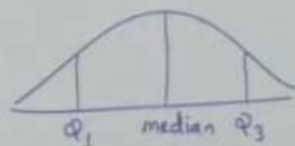
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Measure of skewness

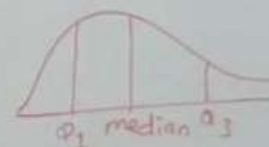
② Bowley's skewness [based on quartiles]



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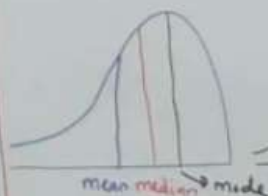
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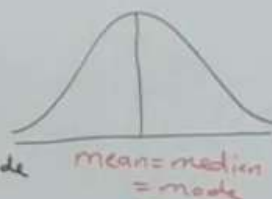
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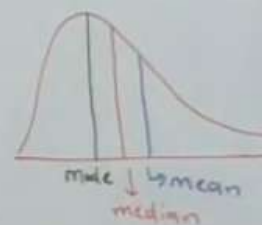


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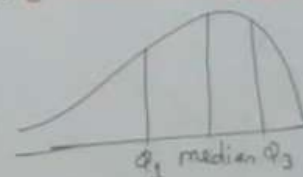
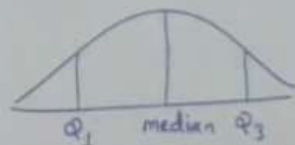
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