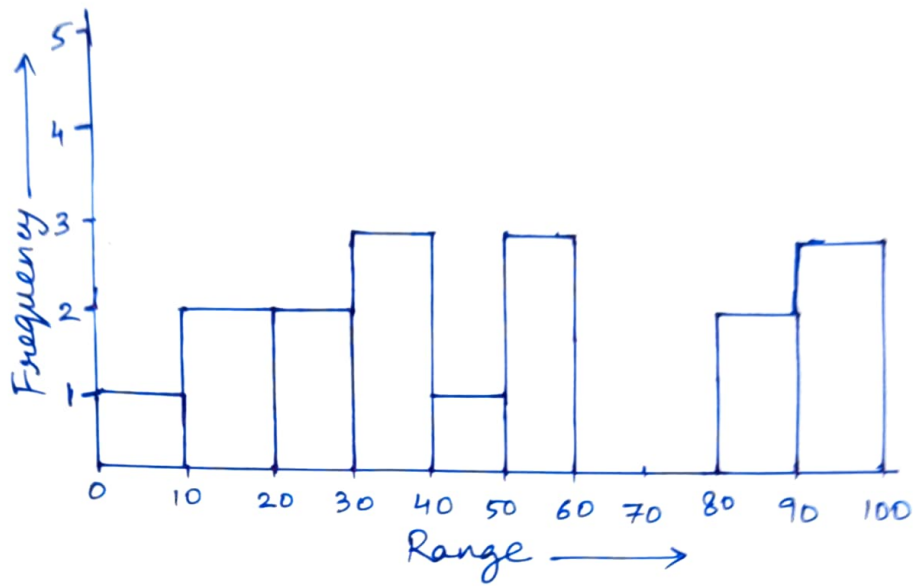


Que 1) Plot a histogram,

10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99

Range Frequency

0-10	1
10-20	2
20-30	2
30-40	3
40-50	1
50-60	3
60-70	0
70-80	0
80-90	2
90-100	3

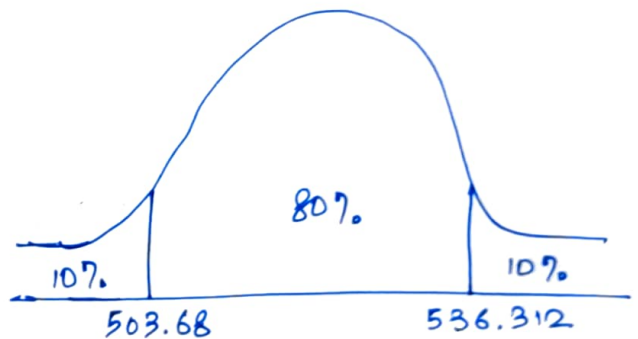


Que 2) In a quant test of the CAT Exam, the population standard deviation is known to be 100. A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the mean.

$$\sigma = 100 \quad \bar{x} = 520 \quad n = 25 \quad \alpha = 1 - 0.8 = 0.2$$

C.I. = Point Estimate \pm Margin Error

$$\begin{aligned}
 &= \bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}} \\
 &= 520 \pm Z_{\frac{0.2}{2}} \frac{100}{\sqrt{25}} \\
 &= 520 \pm Z_{0.1} \times 20 \\
 &= 520 \pm 0.81594 \times 20
 \end{aligned}$$



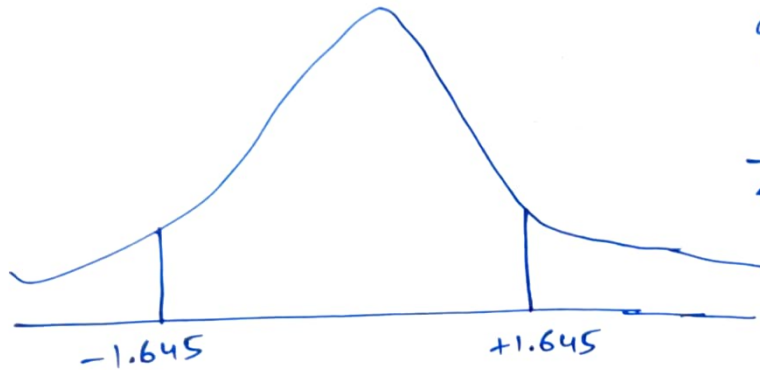
$$\begin{aligned}
 \text{Lower limit} &= 520 - 0.81594 \times 20 \\
 &= 520 - 16.312 \\
 &= 503.68
 \end{aligned}$$

$$\begin{aligned}
 \text{Upper limit} &= 520 + 0.81594 \times 20 \\
 &= 520 + 16.312 \\
 &= 536.312
 \end{aligned}$$

Que 3) A car believes that the percentage of citizens in city ABC that owns a vehicle is 60% or less. A sales manager disagrees with this. He conducted a hypothesis testing surveying 250 residents & found that 170 residents responded yes to owning a vehicle.

- State the null & alternate hypothesis.
- At a 10% significance level, is there enough evidence to support the idea that vehicle owner in ABC city is 60% or less.

(a) Null Hypothesis $H_0 : P_0 \leq 60\%$ (b) $n = 250$ $x = 170$ $P_0 = 0.6$
 Alternate Hypothesis $H_A : P_A \neq 60\%$ $\hat{P} = \frac{x}{n} = \frac{170}{250} = 0.68$



$$q_0 = 1 - P_0 = 1 - 0.6 \Rightarrow 0.4 \quad \alpha = 0.10$$

$$Z_{test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}}$$

$$= \frac{0.08}{\sqrt{\frac{0.24}{250}}}$$

$$= \frac{0.08}{0.0309} \Rightarrow 2.59$$

Since 2.59 does not lie in the range stated in the graph hence the null hypothesis is rejected.

Que 4) What is the value of the 99 percentile?

2,2,3,4,5,5,6,7,8,8,8,8,9,9,10,11,11,12

$$n = 20 \quad \text{value} = \frac{\text{Percentile}}{100} \times (n+1)$$

$$= \frac{99}{100} \times 21$$

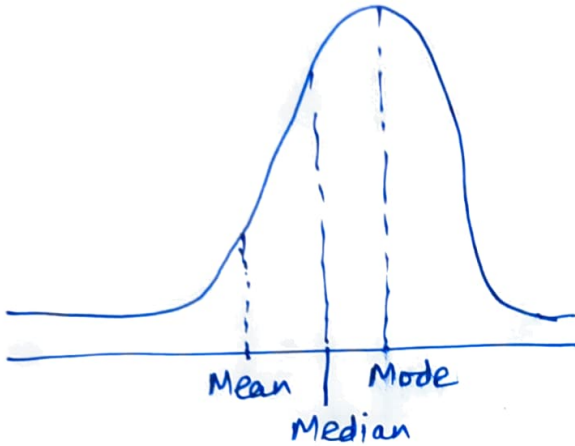
$$= 0.99 \times 21$$

$$= 20.79^{\text{th}} \text{ index}$$

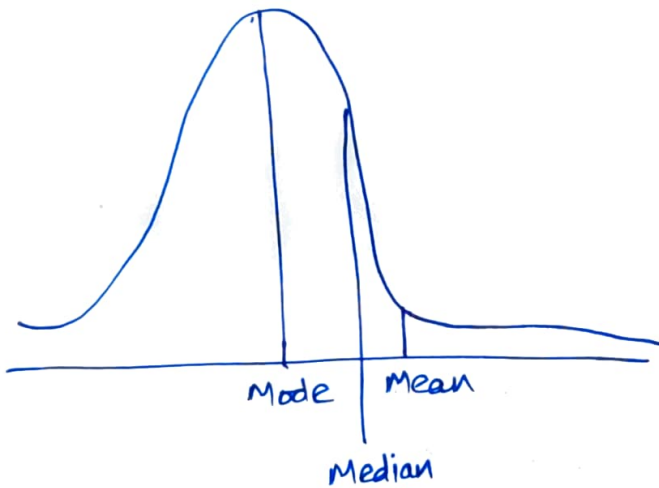
or 20th index which is 12

Que 5) In left & right-skewed data, what is the relationship between mean, median & mode?

Draw the graph to represent the same.



For left skewed,
 $\text{Mode} > \text{Median} > \text{Mean}$



For Right skewed,
 $\text{Mean} > \text{Median} > \text{Mode}$