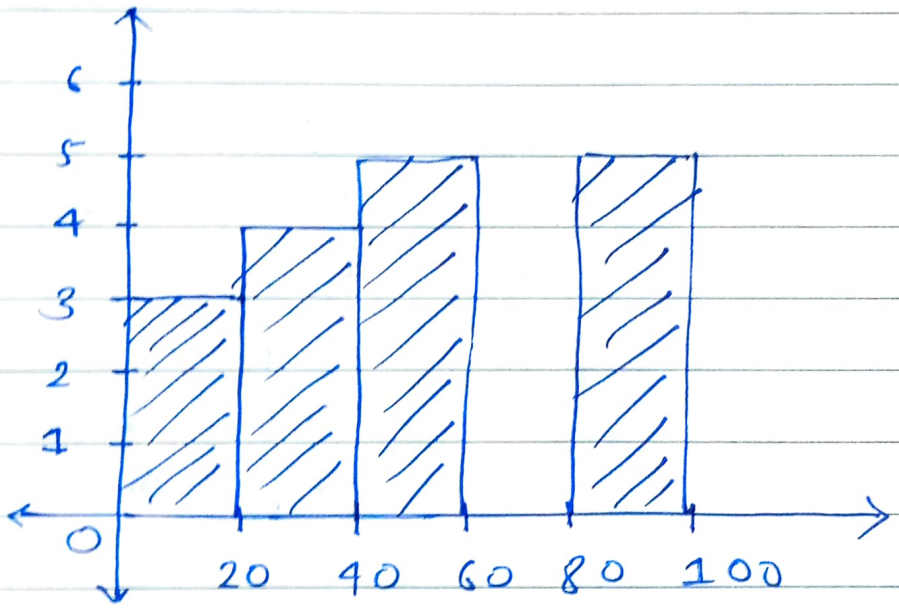
Assignment 1:- Statistics Day - 1 (19/06/2022)

1) Eg:- 10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99

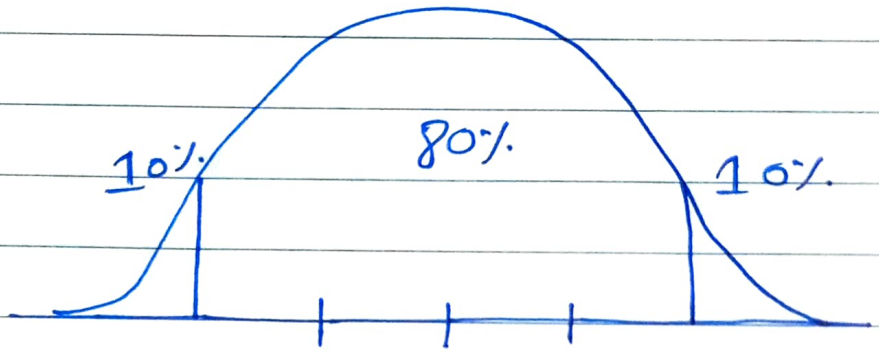
Bins = 5

Bin size = 20



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.

→



$\alpha = 0.2$ $t_{0.2/2} = t_{0.1}$

Degree of freedom

$n - 1 = 25 - 1 = 24$

The total proportion for both tails is 0.2
The proportion in each tail is 0.1

$t = 1.3178$

lower bound

$$520 - 1.3178 \left(\frac{100}{\sqrt{25}} \right) = 493.464$$

upper bound

$$520 + 1.3178\left(\frac{100}{\sqrt{25}}\right) = 546.536$$

I am 80% confident the CAT exam score is betⁿ 493.464 to 546.536

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

a) state the null & alternate hypothesis.

b) At a 10% significance level, is there enough evidence to support the idea that vehicle owner in ABC city is 60% or less.

→ $H_0 : P \leq 0.60$

$H_1 : P > 0.60$

$n = 250$

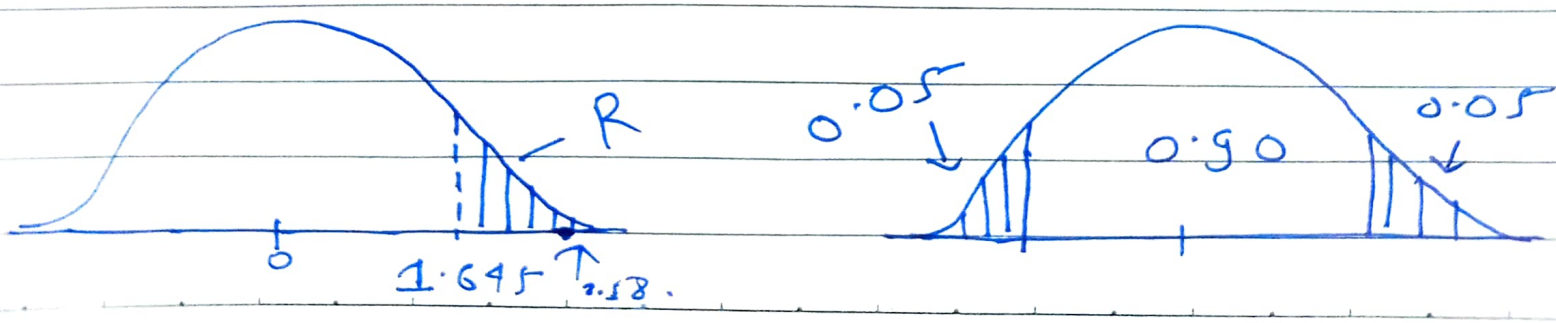
$x = 170$

$\hat{p} = \frac{170}{250} = 0.68$

$p_0 = 0.60$

$q_0 = 1 - 0.6 = 0.40$

$\alpha = 0.10$ $\quad C = 1 - \alpha = 1 - 0.10 = 0.90$



$$\sqrt{\frac{pq}{n}} \qquad \sqrt{\frac{0.60(0.40)}{250}}$$

$$z = \frac{0.08}{0.030984} = 2.58$$

⇒ At a 10% significance level is there enough evidence to reject the idea that vehicle owner in ABC city is 60% or less.

6.4) what is the value of the 99 percentile?

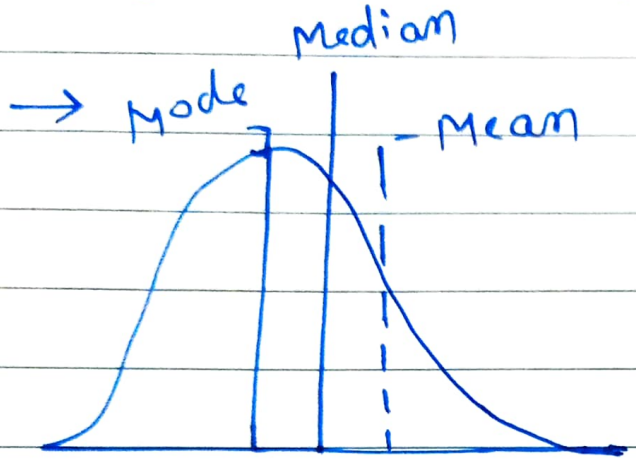
2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 9, 9, 10, 11, 11, 11

→ 55% → 99%

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

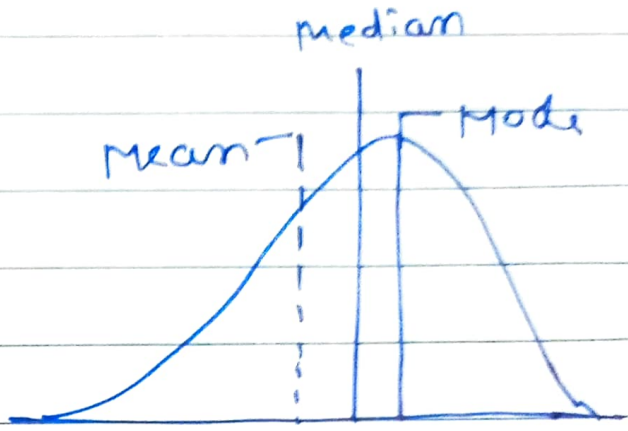
$$\text{value} = \frac{99}{100} \times 21 = 20.79$$

Q.5> In left & right-skewed data, what is the relationship b/t^n mean, median, & mode? Draw the graph to represent the same.



+ skew

Mean > Median > Mode



- skew

Mode > median > Mea