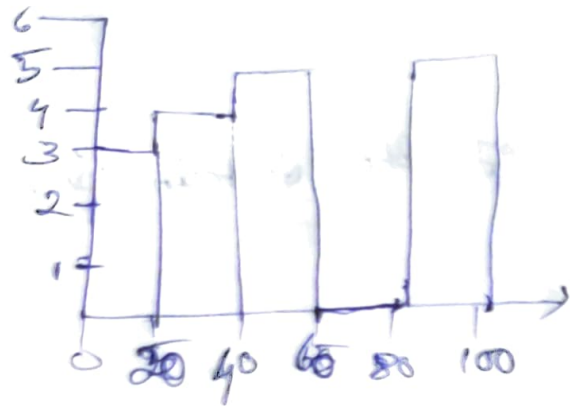


Q1 - {10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99}

bins = 5, bin size = 20



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

Ans-

$$\sigma = 100, n = 25, \bar{x} = 520, C.I = 80\%$$

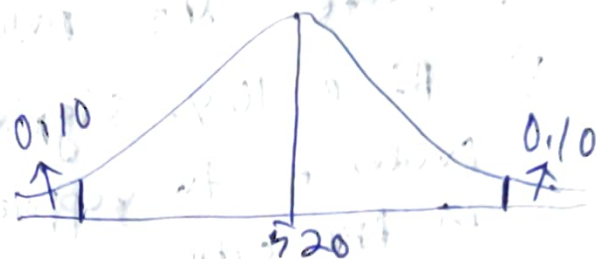
$$\alpha = 1 - 0.80 \\ = 0.20$$

$$M.O.E = z_{\alpha/2} \times \frac{\sigma}{\sqrt{n}}$$

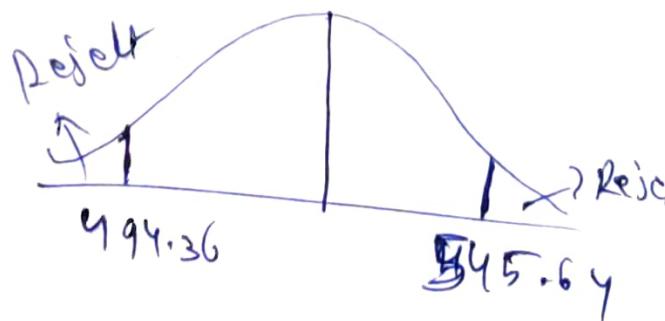
$$= 2 \times 0.10$$

$$= 1 - 0.10 = 0.90 \Rightarrow 1.282$$

$$L.I = \bar{x} - z_{\alpha/2} \times \frac{\sigma}{\sqrt{n}} \\ = 520 - 1.282 \times \frac{100}{\sqrt{25}} \\ = 520 - 1.282 \times \frac{100 \times 20}{5} \\ = 494.36$$



$$U.I = \bar{x} + z_{\alpha/2} \times \frac{\sigma}{\sqrt{n}} \\ = 520 + 1.282 \times \frac{100}{\sqrt{25}} \\ = 520 + 1.282 \times 20 \\ = 545.64$$



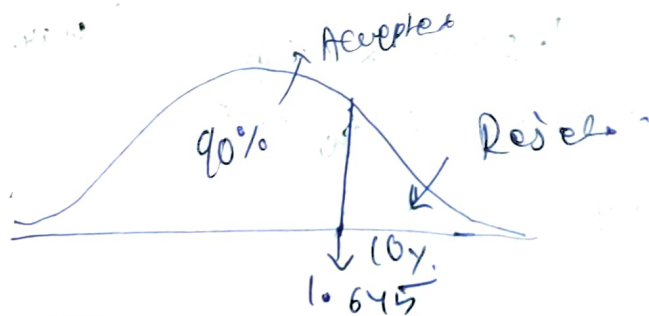
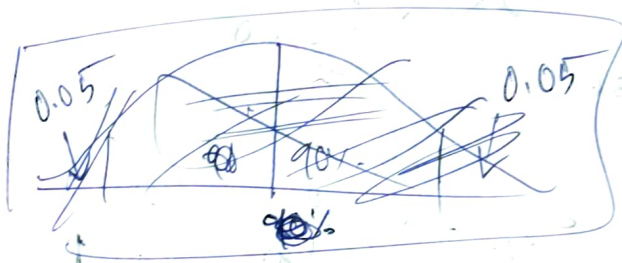
Q3) A ^{Company} ~~Company~~ believes that the percentage of Citizens in City ABC that own a Vehicle is 60% or less. A Sales manager disagree with this. He conducted a hypothesis testing surveying 250 residents & found 170 residents responded yes to owning a vehicle.

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

Ans-

$$\mu = 60\% , n = 250 , \bar{x} = 170 , \alpha = 0.10$$

$$H_0 = \mu \leq 60\% \quad H_1 = \mu > 60\%$$



$$\bar{p} = \frac{\bar{x}}{n} = \frac{170}{250} = 0.68$$

$$p_0 = 0.60 , q_0 = 1 - p_0 = 0.40$$

$$z = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.40}{250}}} = \frac{0.08}{0.031} = 2.59$$

The null hypothesis is rejected because Z value is ~~2.59~~ 2.59 is greater than 1.645 with 90% C.I.

Q4) What is the value of the 99 percentile.

Dataset = { 2, 2, 3, 4, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12 }

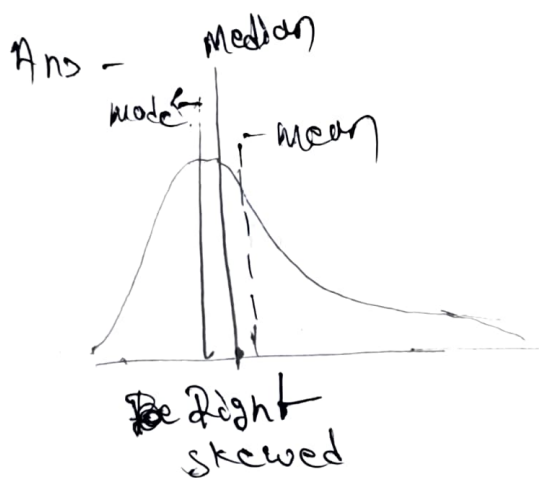
$$\text{Ans} = \frac{99}{100} \times (19+1)$$

$$= \frac{99}{100} \times 20 = 24.75 \text{ 'Ans'}$$

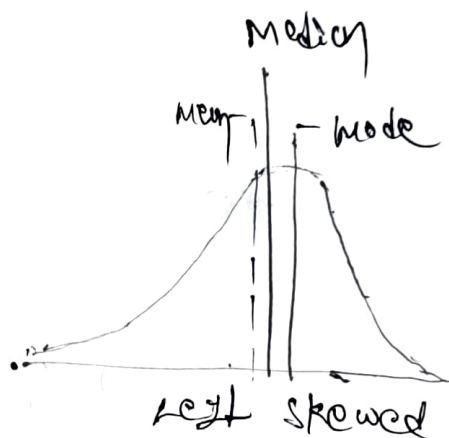
Approximate 25th index
Value

∴ 12th is come in the 99 percentile

Q5) In left & right-skewed data, what is the relation between mean, median & mode? Draw the graph to represent the same.



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



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