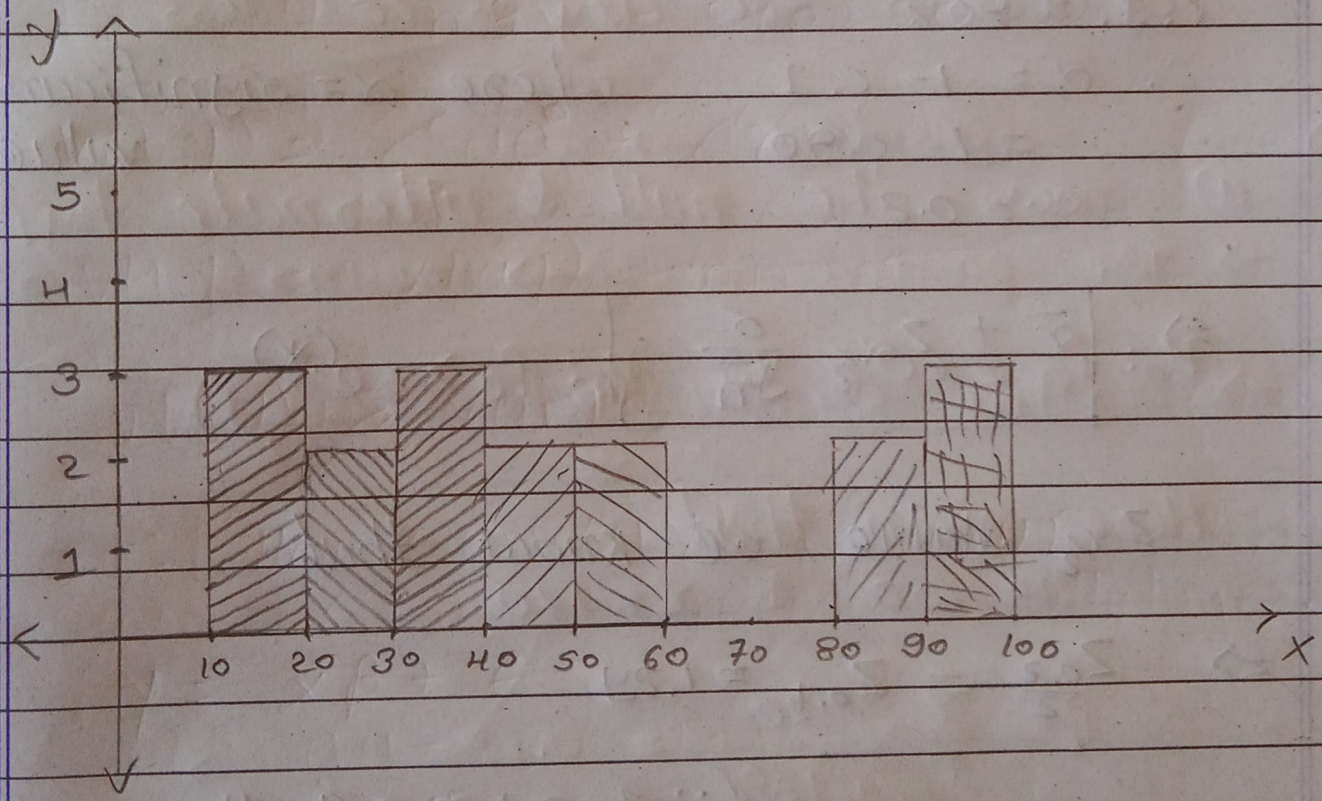
Q-1 plot a histogram

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

Sol^n ⇒ Bins = 10 (suppose)
[0-100]

$$\text{Bins size} = \frac{100}{10} = 10$$



Q-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 80% CI about the mean.

soln →

given

$\sigma = 100$

$n = 25$

$\bar{x} = 520$

C.I. = 80%

$\therefore \alpha = 1 - C.I$ where α = significant value

$= 1 - 0.80$

$= 0.2$

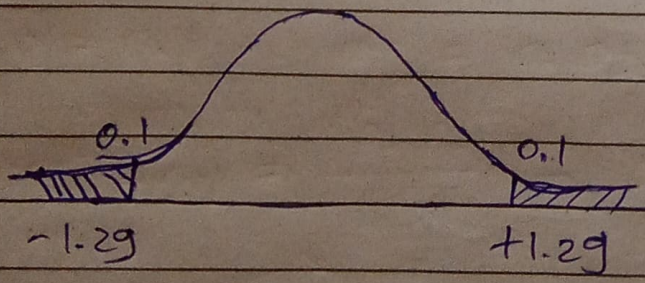
$\Rightarrow \boxed{\bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}}$ ——— (*)

$Z_{\alpha/2}$ value, we know that

$\Rightarrow Z_{\frac{0.2}{2}} = Z_{0.1} = 1.29$

(∵ 1 - 0.1 = 0.9 this value see in z-table) ~~see in z-table~~

$\Rightarrow$



$\Rightarrow$ Lower ~~Fentil~~ value $= \bar{x} - z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

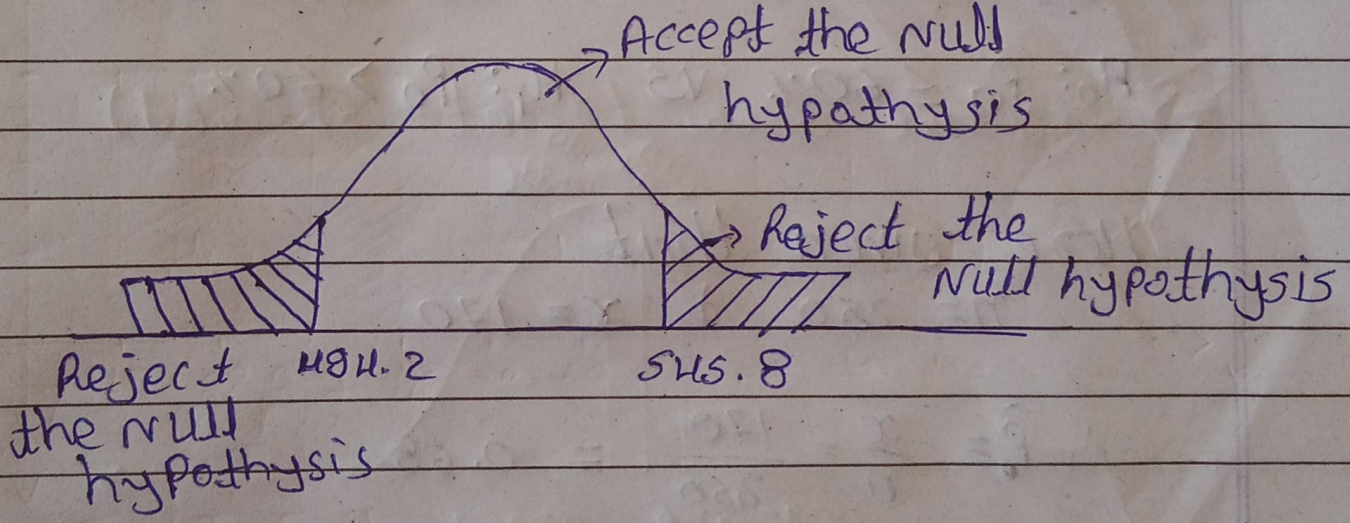
$= 520 - 1.29 \times \frac{100}{\sqrt{25}}$

lower ~~fentil~~ value $= 494.2$

$\Rightarrow$ highest value $= \bar{x} + z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

$= 520 + 1.29 \times \frac{100}{\sqrt{25}}$

$= 545.8$



Q-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 hypothysis 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% less

Sol^n =>

a) now, the null & alternate hypothesis is,

$H_0: P_0 \leq 60\%$ VS $H_1: P_0 > 60\%$

Here, given that

$n = 250$ & $x = 170$

$\therefore \hat{P}_0 = \frac{x}{n} = \frac{170}{250} = 0.68$

$q_0 = 1 - P_0 = 1 - 0.6 = 0.4$

$\alpha = 0.1 \quad \alpha/2 = 0.05 \quad \therefore Z_{tab} = 1.28$

now $Z_{cal} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = 2.5820$

Here $2.58 > 1.28$

then $Z_{cal} > Z_{tab}$, we reject H_0

Q-4 what is the value of ~~reptile~~ 99 percentile?

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

Sol^n ⇒ ~~n=20~~

Here given that

$n = 20$ & 99 percentile

$$\text{value} = \frac{\text{Percentile}}{100} \times n$$

$$= \frac{99}{100} \times 20$$

$$= 19.8 \text{ Index}$$

$$\text{Average} = \frac{19 \text{ obs}^n + 2 \text{ obs}^n}{2}$$

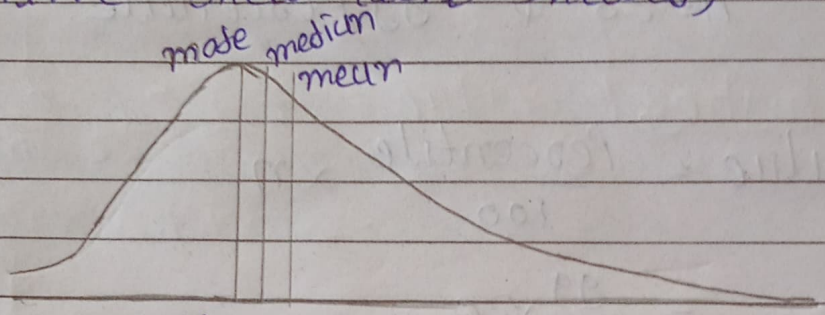
$$= \frac{11 + 12}{2}$$

Average = 11.5

Q-5 In left & right-skewed data, what is the relationship between mean, median and mode ?
→ Draw the graph to represent the same.

Soln ⇒

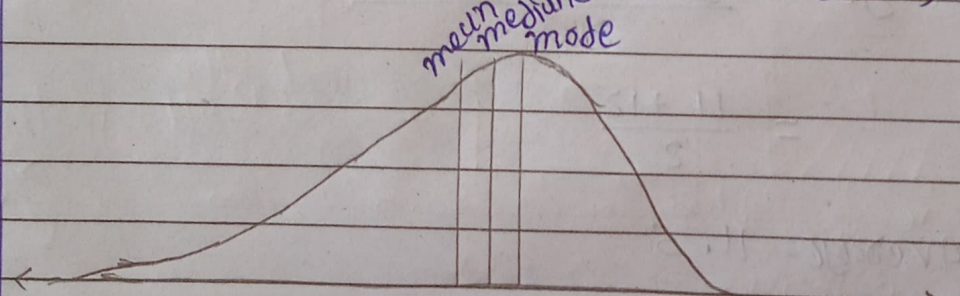
→ positive skew (left-skewed)



positive skew

→ In positive skeve → mean > median > mode

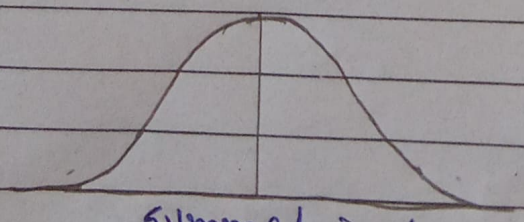
→ negative skew (right-skewed)



negetive skew

→ In negative skeve → mean < median < mode

→ symmetrical distribution.



symmetrical distribution

→ In symmetrical distributio
mean = median = mode