

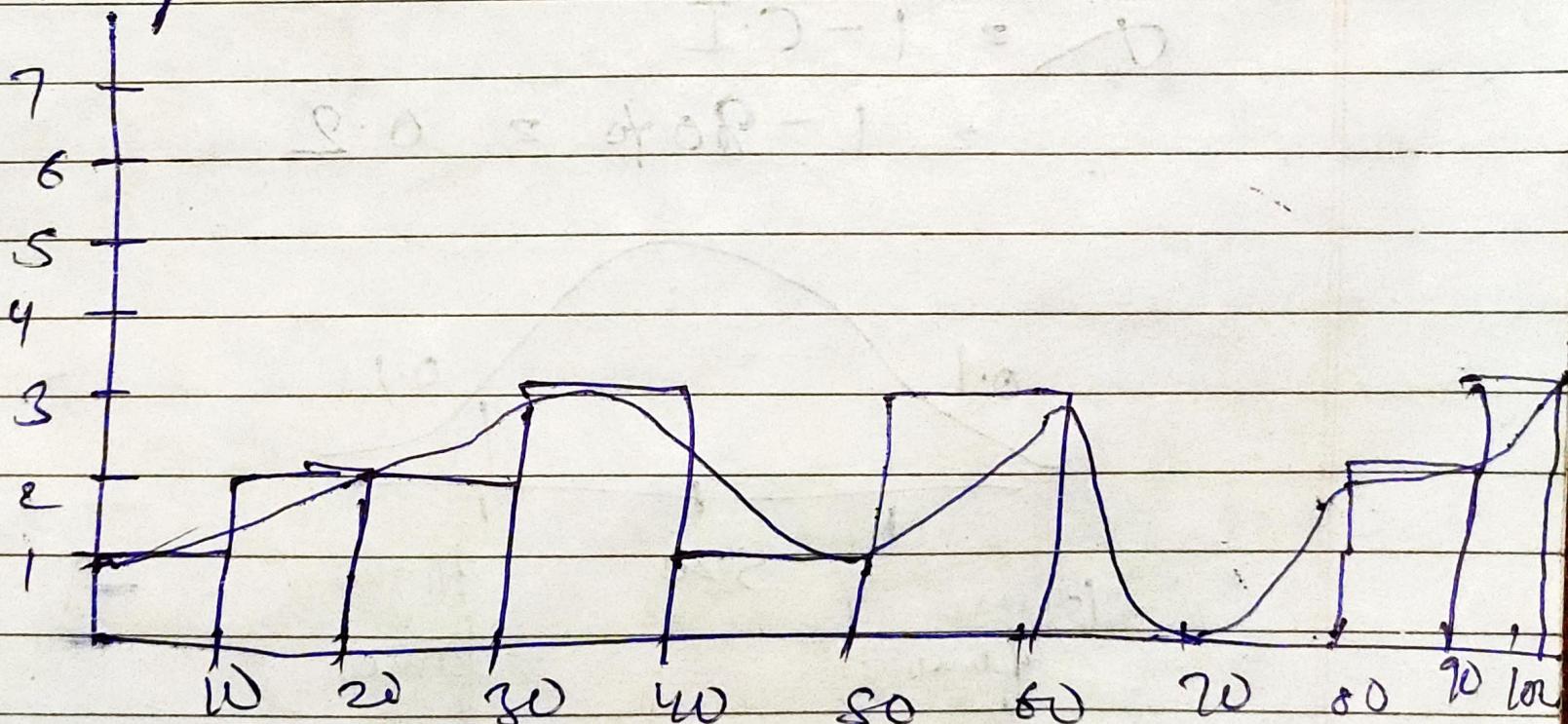
① Plot a histogram

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

② Analyse the data

Bin Size = $\frac{100}{10} = 10$ bins

frequency



(2) In a quant test of the SAT Exam, the 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.

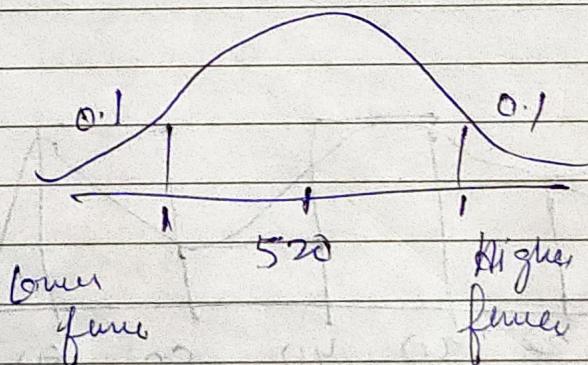
$$\sigma = 100, n = 25, \bar{x} = 520$$

Z-score Test to be applied
Because Population SD is given

$$CI = 80\%$$

$$\alpha = 1 - CI$$

$$\approx 1 - 80\% = 0.2$$

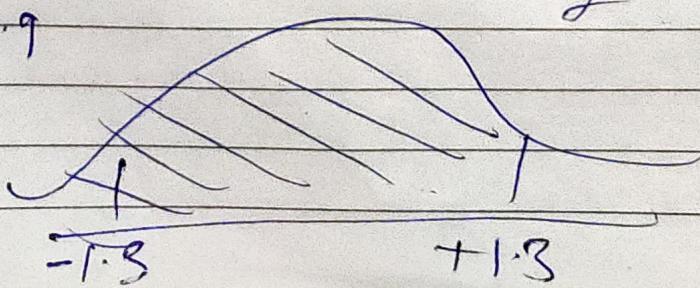


$$Z_{\frac{\alpha}{2}} = \frac{\text{_____}}{\sqrt{n}}$$

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

$$1 - 0.1 = 0.9$$

$$= Z_{0.1}$$



$$\text{Lower fence} \Rightarrow \bar{x} - Z_{2/2} \frac{\sigma}{\sqrt{n}}$$

$$= 520 - 1.3 \frac{100}{\sqrt{25}}$$

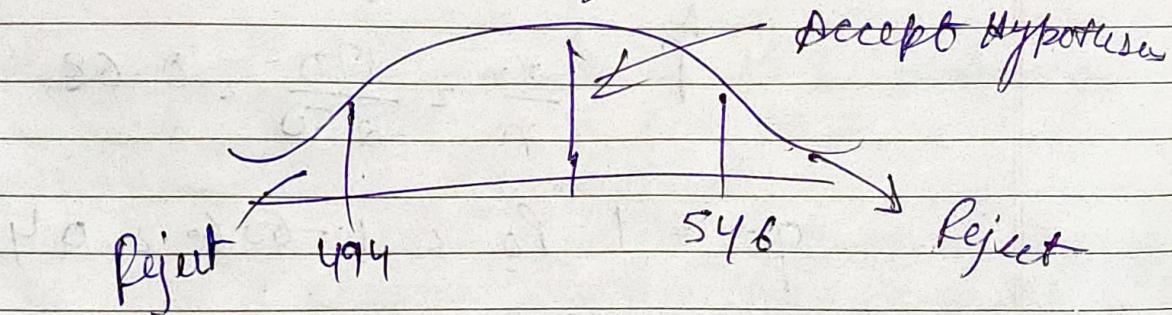
$$= 520 - 26$$

$$= 494$$

$$\text{Higher fence} = \bar{x} + Z_{2/2} \frac{\sigma}{\sqrt{n}}$$

$$= 520 + 1.3 \times 20$$

$$= 546$$



Company

Q3 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 and found that 170 residents responded yes to owning a vehicle.

- (a) State the null & alternative Hypothesis
- (b) At a 10% significance level, Is there enough evidence to support the idea that vehicle owner in ABC city is Go fo or lesser.

$$H_0 = P_0 = 60\%$$

$$P_0 \neq 60\%$$

$$n = 250$$

$$x = 170$$

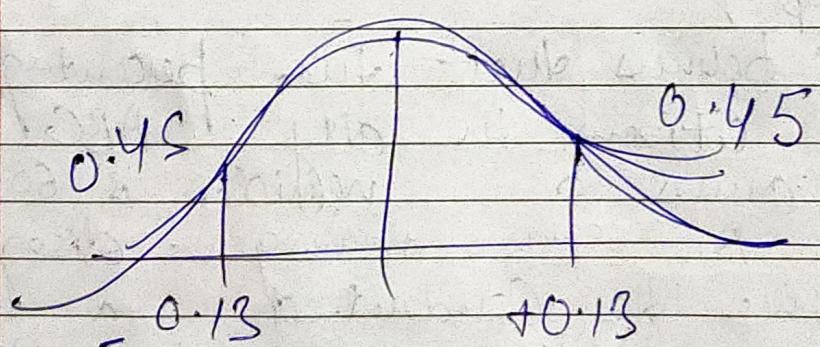
$$\hat{P} = \frac{x}{n} = \frac{170}{250} = 0.68$$

$$q_0 = 1 - P_0 = 1 - 60\% = 0.4$$

$$1 - C.I$$

$$\Delta = 1 - 10\% = 0.9$$

$$1 - 0.48 = 0.52$$



$$\begin{aligned} Z \text{ test} &= \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.4}{250}}} = \frac{0.08}{0.03} = 2.66 \end{aligned}$$

Accept new hypothesis $0.13 < 2.08$

(9) 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, 12

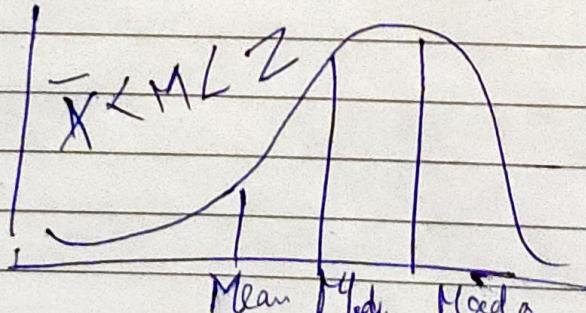
$$\text{Value} = \frac{\text{Percentile} \times n}{100}$$

$$\frac{99}{100} \times 20 = 19.8 \text{ Index } \underline{\underline{99}}$$

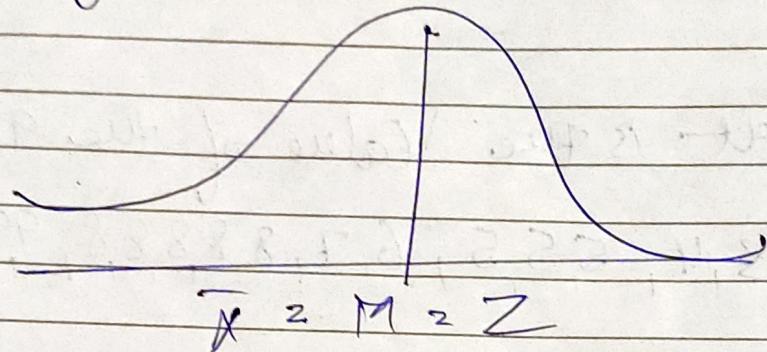
(5) In left & right-skewed data, what is the relationship between mean, median & mode?

(A) Left Skewed / Negatively Skewed

When data is left skewed, mean would be less than median and mode because it always falls in centre.



(b) Normal distribution \rightarrow Here all
things will be equal



(c) Right / Neg / Positive Skewed

