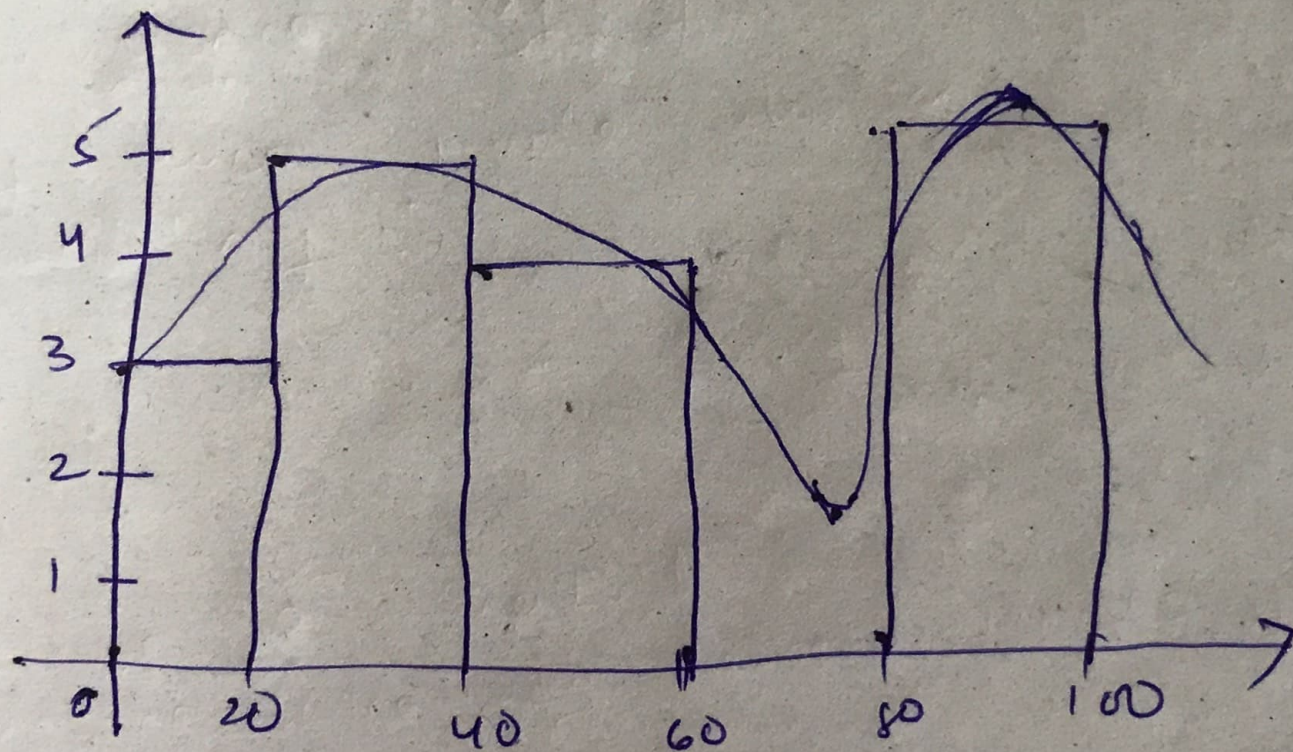


Q.7 Eg: {10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 62, 66, 70, 74, 79, 84, 89, 90, 92, 94, 99, 100}

bin size = 5

bin size = 20



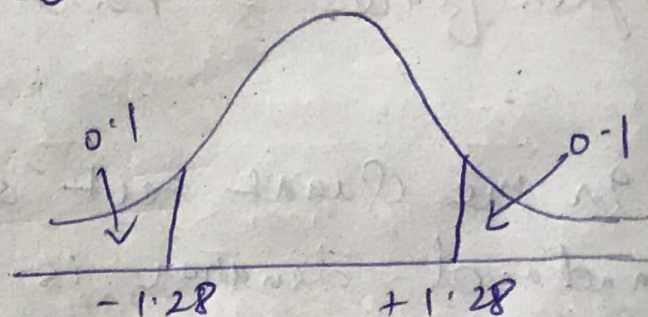
Assignment
(b) Construct a 80% CI about mean.

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

$\alpha = 0.2$ $CI = 80\%$

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

From Z table $= 1.28$



$$\bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

lower fence $= \bar{x} - Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

$$= 520 - 1.28 \times \frac{100}{\sqrt{25}}$$

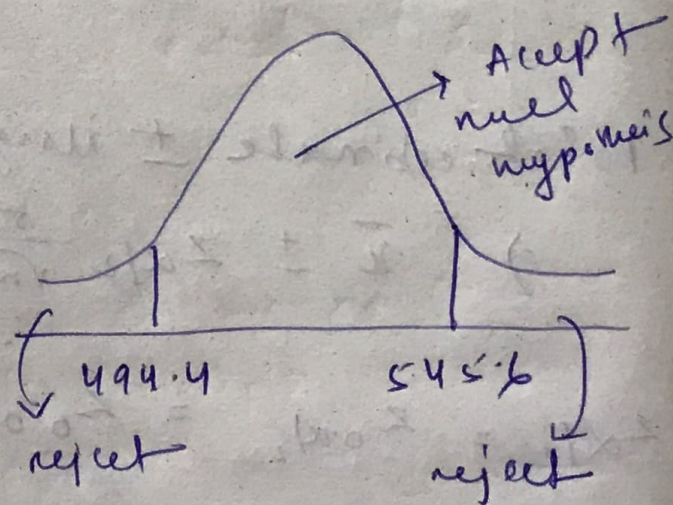
$$= 520 - 1.28 \times 20 = \underline{\underline{494.4}}$$

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

$$= 520 + 1.28 \times \frac{100}{\sqrt{25}}$$

$$= 520 + 1.28 \times 20$$

$$= \underline{\underline{545.6}}$$



Assignment

Q) A car company believes that the % of residents in city ABC that owns a vehicle is 60% or less.

A sales manager disagrees with this. He conducts a hypothesis testing surveying 250 residents and found that 170 responded yes to owning a vehicle.

(a) state the null & alternate hypothesis.

(b) At 10% significance level, is there evidence to support the idea that vehicle ownership in city ABC is 60% or less?

Ans) Null hypothesis $H_0: P_0 \leq 60\%$

Alternate hypothesis $H_1: P_1 > 60\%$

$$n = 250 \quad x = 170$$

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

$$\begin{aligned} q_0 &= 1 - P_0 \\ &= 1 - 0.60 \\ &= 0.4 \end{aligned}$$

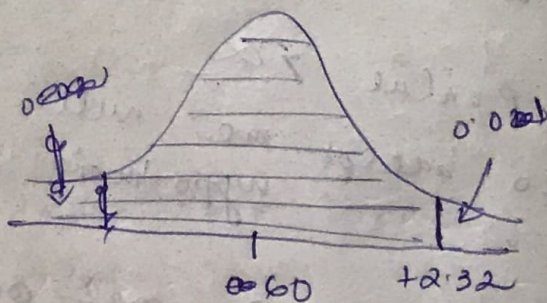
$$\alpha = 0.01 \quad \text{here we use z test.}$$

$$\cancel{Z_{\alpha/2}} = \cancel{Z_{0.005}} \quad Z_{\alpha} = 0.01$$

from z table it is
 -2.32

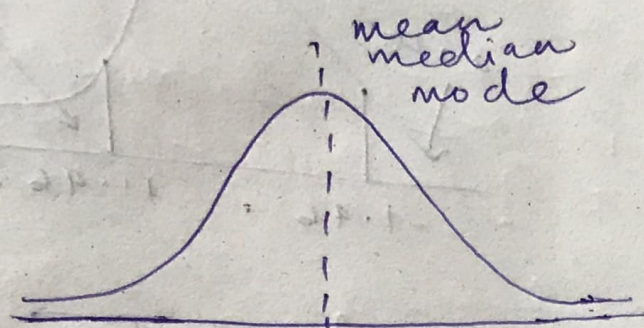
z score with proportion

$$\begin{aligned} &= \frac{\hat{p} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08}{0.0399} \\ &= 2.58 \end{aligned}$$

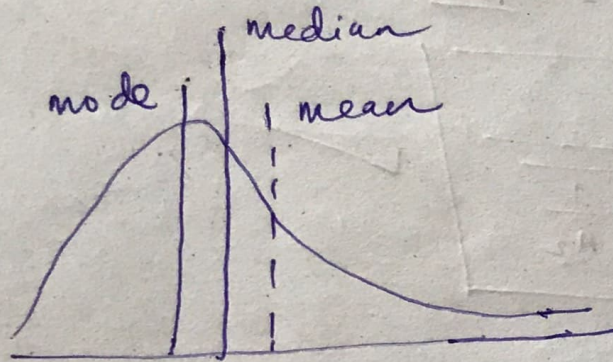


As 2.58 is > 2.32 so reject the null hypothesis.

Q.7) what is the relationship between mean, median & mode in left & right skewed data?

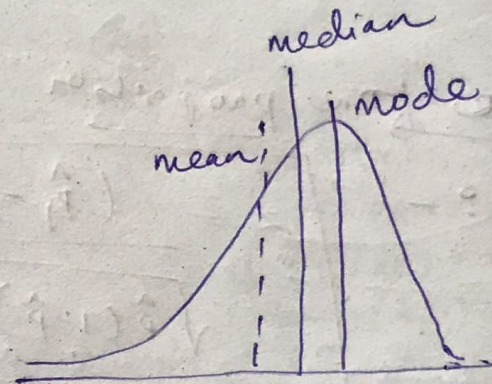


mean = median = mode
symmetrical distribution



right skewed

mean > median > mode



left skewed

mode > median > mean

Q.7) what is the value of 99 percentile
2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12

$$\text{the } 7^{\text{th}} \text{ value} = \frac{\text{percentile}}{100} \times (n + 1)$$

$$= \frac{99}{100} \times (21) = 20.79 \text{ index} \quad \text{so value is } \underline{\underline{12}}$$