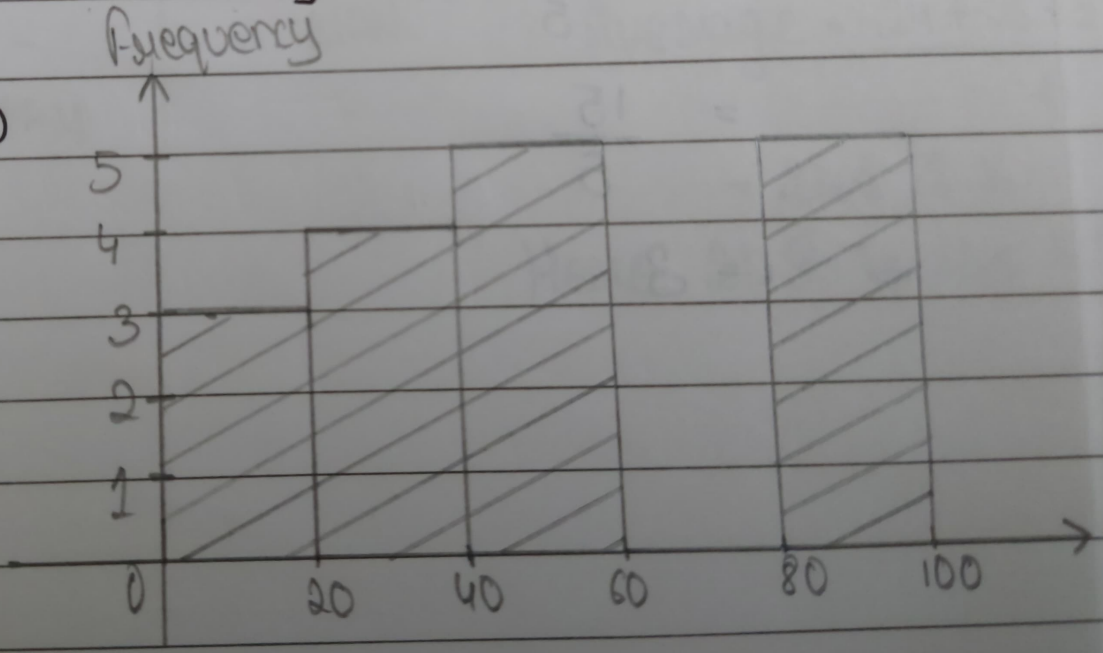
ASSINGMENT :—

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

Bins = 5

Bins size = 20



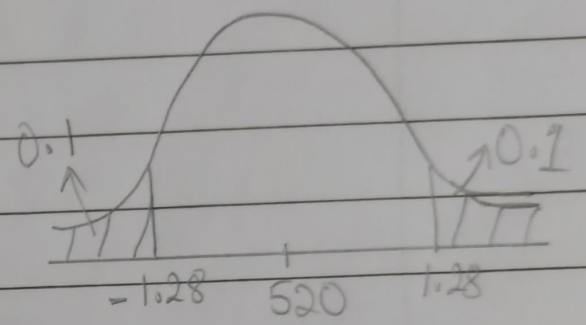
In a quant test of the CAT Exam, the population standard deviation is known to be 100. A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the mean.

$\sigma = 100$, $n = 25$, $\bar{x} = 520$, CI 80%

$\alpha = 1 - CI$

$= 1 - 0.8$

$= 0.2$



Point of estimate ± Margin of Error

$\bar{x} \pm Z_{\alpha/2} \left(\frac{\sigma}{\sqrt{n}}\right)$

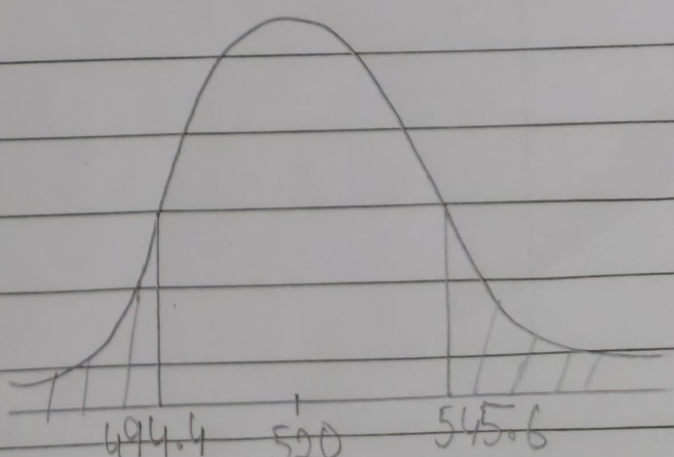
$Z_{\frac{\alpha}{2}} = Z_{\frac{0.2}{2}} = Z_{0.1} = 1.28$

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

$= 494.4$

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

$= 545.6$



A car company believes that the percentage 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 & found that 170 responded "Yes", to owning a vehicle.

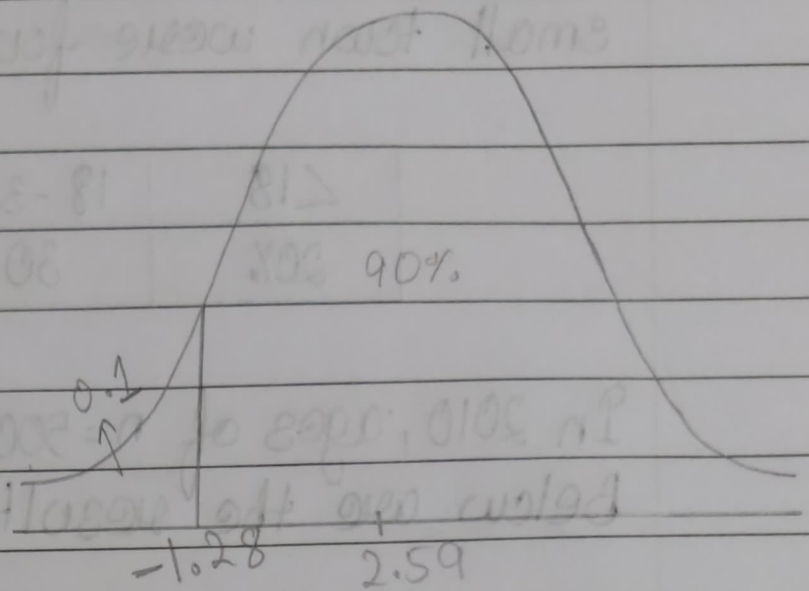
a) State null & Alternate hypothesis

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

$n = 250 \quad x = 170$

$H_0 \Rightarrow P_0 > 60\%$

$H_1 \Rightarrow P_0 \leq 60\%$



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

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

$$\alpha = 0.1$$

$$Z\text{-test} = \frac{\hat{p} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}}$$

$$= 2.5819 \approx = 2.59$$

$2.59 > 1.28$

$\therefore$ Null hypothesis is accepted

Conclusion: The vehicle ownership in the city ABC is more then 60%.

What is the value of the 99 percentile?

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

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

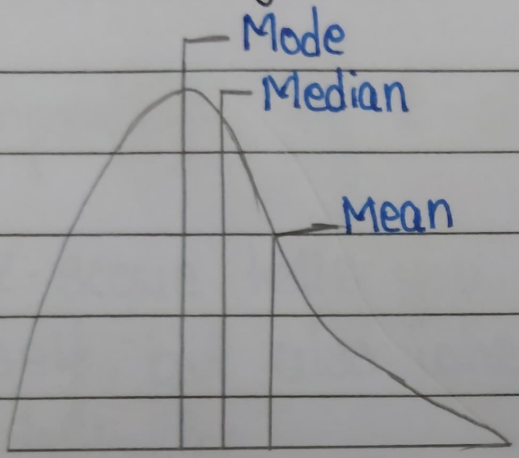
$$= \frac{99}{100} \times 20$$

$$= 19.8 \text{ (Index)}$$

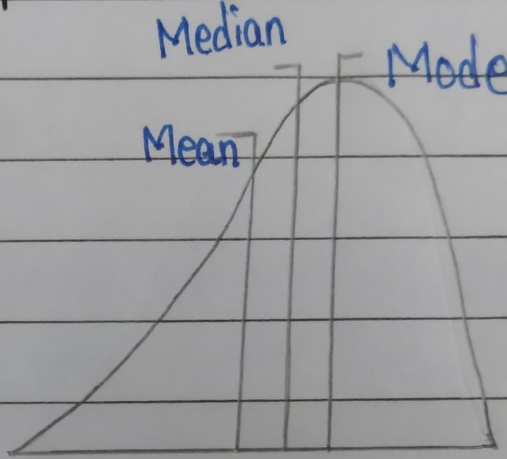
$$= \frac{11 + 12}{2}$$

$$= 11.5$$

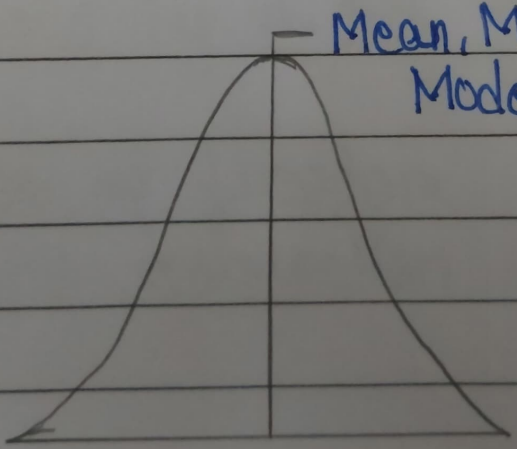
In left & right-skewed data, what is the relationship b/w mean, median & mode?
Draw the graph to represent the same.



Right Skewed



Left Skewed



Normal Distribution

In normal distribution:

$$\text{Mean} \simeq \text{Mode} \simeq \text{Median}$$

In Right skewed:

$$\text{Mean} > \text{Median} > \text{Mode}$$

In left skewed:

$$\text{Mode} > \text{Median} > \text{Mean}$$