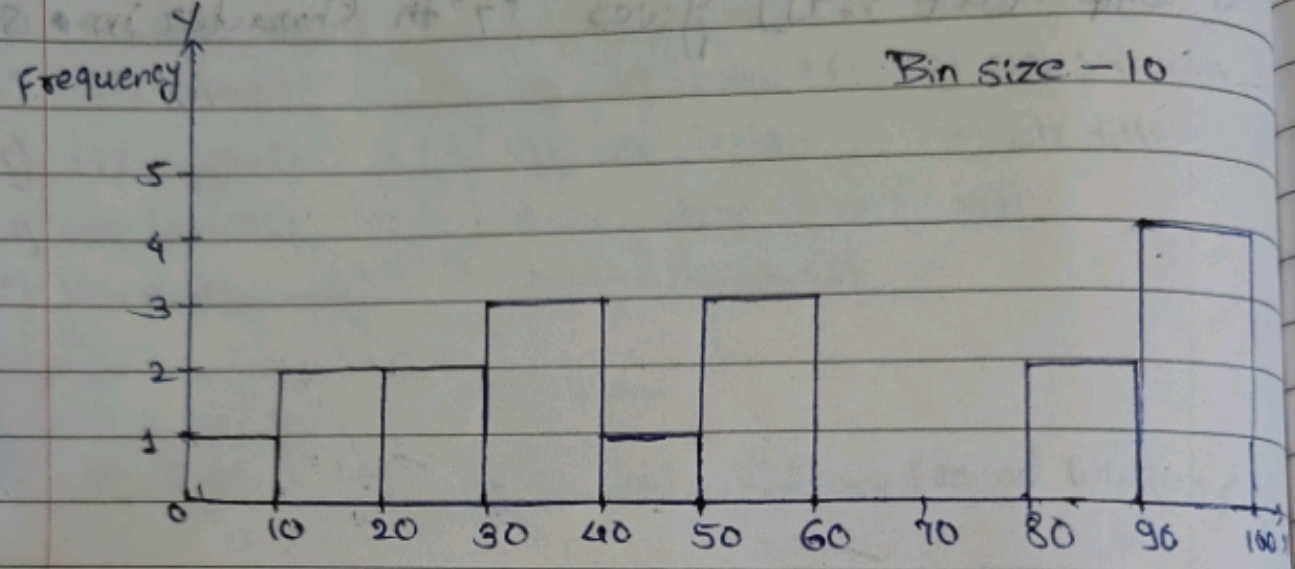
Q.1] Plot a histogram

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

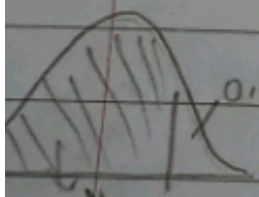


Q.2] In a quant test of the CAT Exam, the populat" S.d is known to be 100. A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the mean.

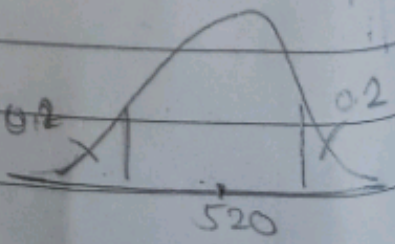
$\Rightarrow \sigma = 100$, $n = 25$, $\bar{x} = 520$, $CI = 80\%$

$\alpha = 1 - CI \Rightarrow 1 - 0.80 \Rightarrow 0.2$

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



$= 520 - Z_{0.2/2} \times \frac{100}{\sqrt{25}}$



$= 520 - Z_{0.1} \times \frac{100}{5}$

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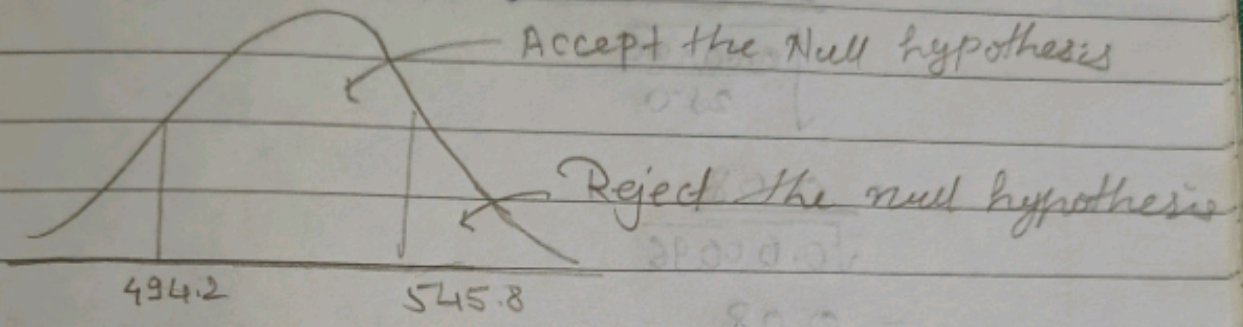
$= 520 - 1.29 \times 20$

$= 494.2$

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

$= 520 + 1.29 \times 20$

$= 545.8$



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 hypothesis testing surveying 250 residents & found that 170 residents responded yes to owing a vehicle.

⇒ ① Null Hypothesis → $H_0 = \mu \leq 60$

Alternate Hypothesis → $H_1 = \mu > 60$

$n = 250$, $x = 170$

Proportion : $\hat{P} = x/n = 170/250 = 0.68$

As P_0 is given $q_0 = 1 - P_0 \Rightarrow 1 - 0.6 = 0.4$

② $\alpha = 0.1$ & C.I. $= 0.9$

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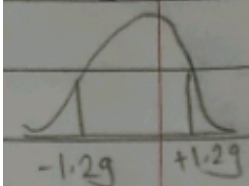
Ztest with Proport



$$= \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.4}{250}}}$$

$$= \frac{0.08}{\sqrt{0.00096}}$$

$$= \frac{0.08}{0.03}$$

$$\approx = 2.66$$

$2.66 > +1.29$ so we reject the null hypothesis

Q.4] 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

$\Longrightarrow$

Percentile Rank = $\frac{\text{Percentile}}{100}$

$$= \frac{99}{100} = 0.99$$

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

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

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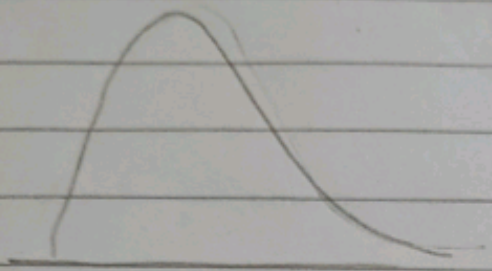
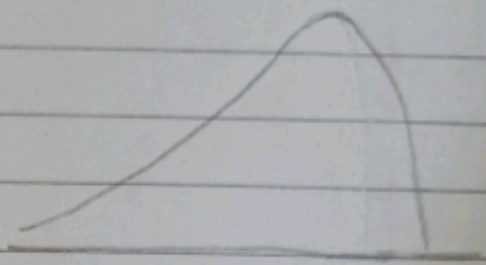
So 12 is the value of 99 percentile.

Q. 5) In left & right-skewed data, what is the relationship bet" mean, median & mode. Draw the graph to represent the same.



Right-Skewed
mean > median > mode



Left skewed
mode > median > mean