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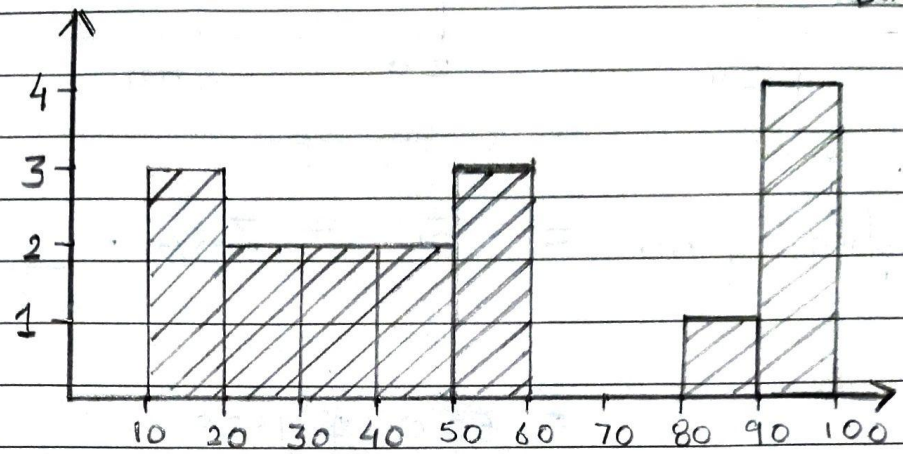
Q. Plot a histogram

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

Bins = 4

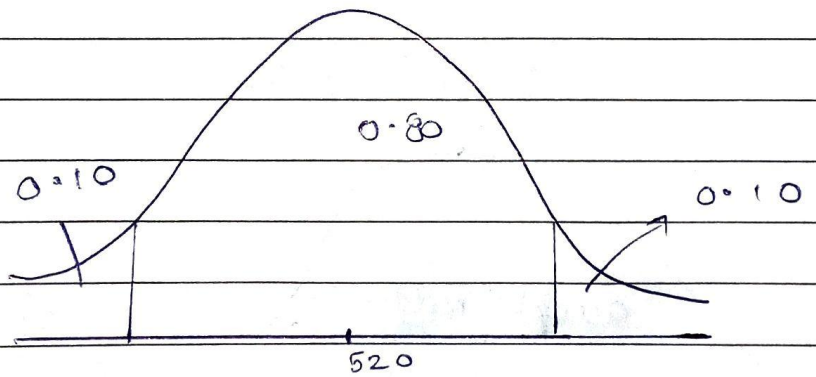
Bin Size = 10



Q. In a Quant test of 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?

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

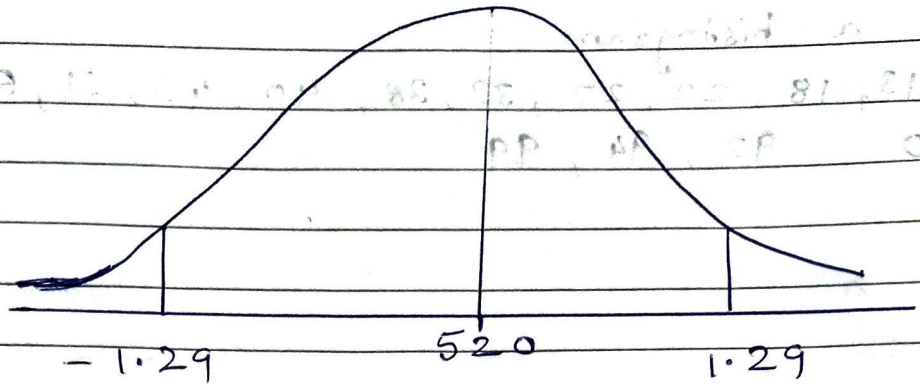
C.I. = 80%, $\alpha = 1 - 0.80 = 0.20$



$Z_{\alpha/2} = Z_{0.2\alpha/2} = Z_{0.10}$

$1 - 0.10 = 0.90$

$Z_{0.90} = 1.29$ [From z-table]



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

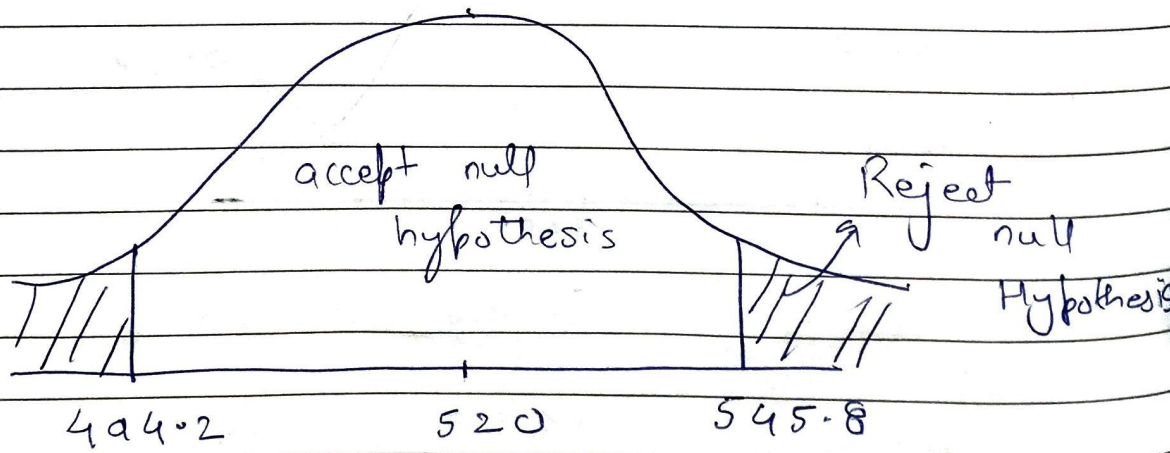
$= 520 + 1.29 \times \frac{100}{\sqrt{25}}$

$= 545.8$

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

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

$= 494.2$



Ans. 3 Null Hypothesis (H_0) = $P_0 \leq 60\%$

Alternate Hypothesis (H_1) = $P_0 > 60\%$

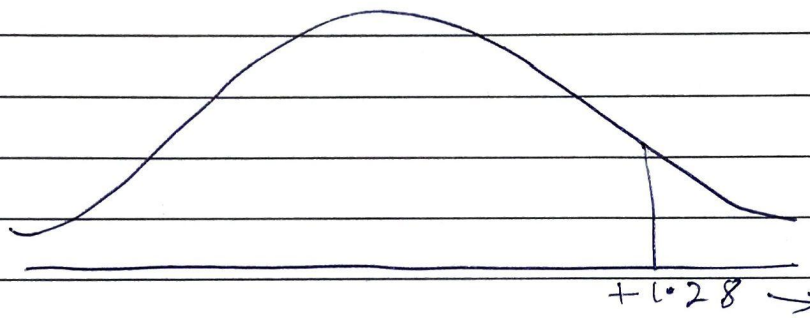
$n = 250$, $x = 170$

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

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

$\alpha = 0.1$

One tail test



→ from Z- table

Test Statistics :—

$$Z\text{-test} = \frac{\hat{p} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.6 \times 0.4}{250}}}$$

$$= 2.58$$

So, $2.58 > 1.28$

So , reject null Hypothesis

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

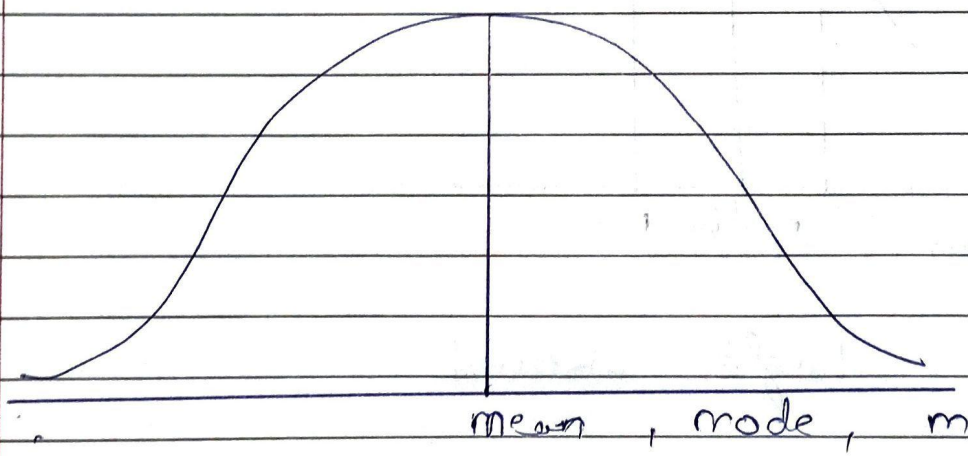
$$\text{Value} = \frac{\text{Percentile}}{100} \times n$$

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

$$= 19.8 \text{ index}$$

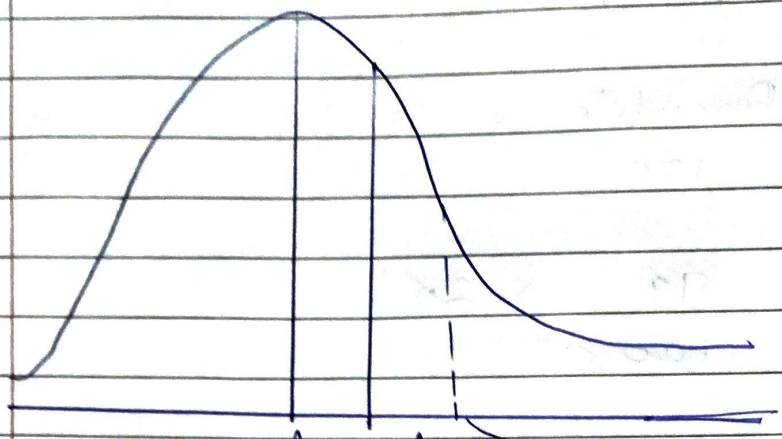
So, $\frac{11 + 12}{2} = \boxed{11.5}$

5.) Relation between mean mode and median,



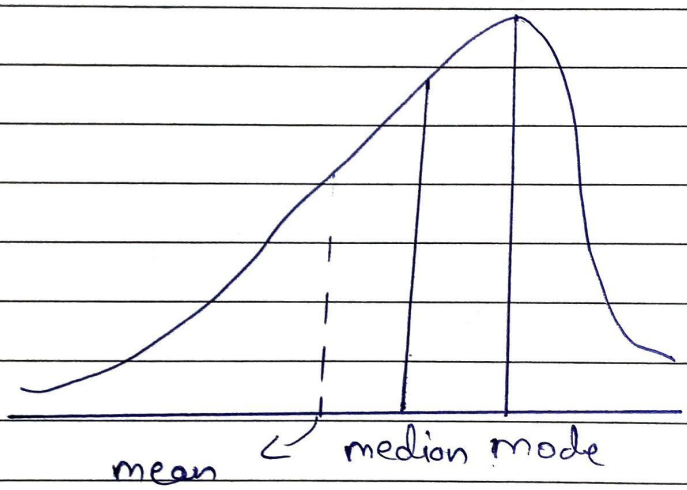
SYMETRICAL DISTRIBUTION

mean = mode = median



Left Skewed

mode < median < mode



Right Skewed

mean < median < mode