Que 1) Plot a histogram,

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

Que 2) 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.

Que 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 owning a vehicle.

a) State the null & alternate hypothesis.
b) At a 10% significance level, is there enough evidence to support the idea that vehicle owner in ABC city is 60% or less.

Que 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

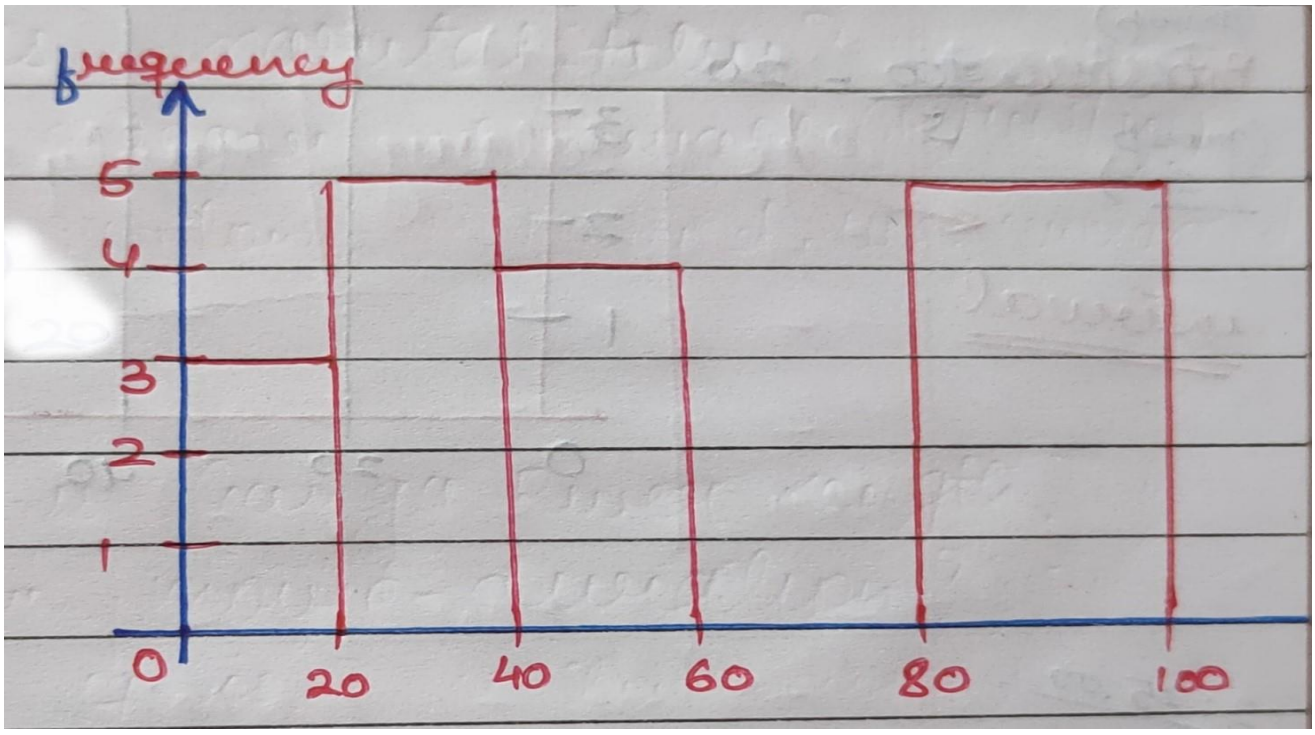
Que 5) In left & right-skewed data, what is the relationship between mean, median & mode?

Draw the graph to represent the same.

Solution 1 : Bins =5

Bin size = 100/5 =20

Figure :



Solution 2

$\sigma = 100$, $n = 25$

$\bar{x} = 520$, $CI = 80\%$

$\alpha = 1 - CI = 1 - 0.8 = 0.2$

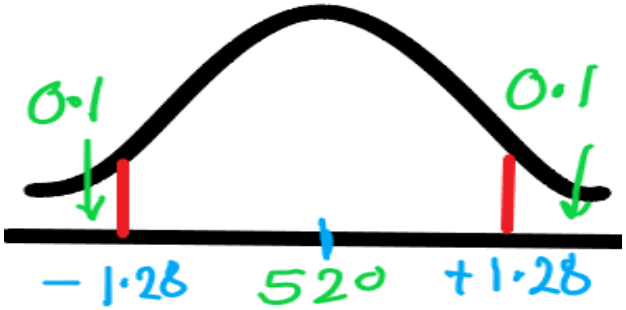
CI = point Estimate $\pm$ Margin of Error

$= \bar{x} \pm [Z_{\alpha/2} \cdot \frac{\sigma}{\sqrt{n}}]$

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

Remaining Area $= 1 - 0.1 = 0.9$

± 1.28 (Z- table)



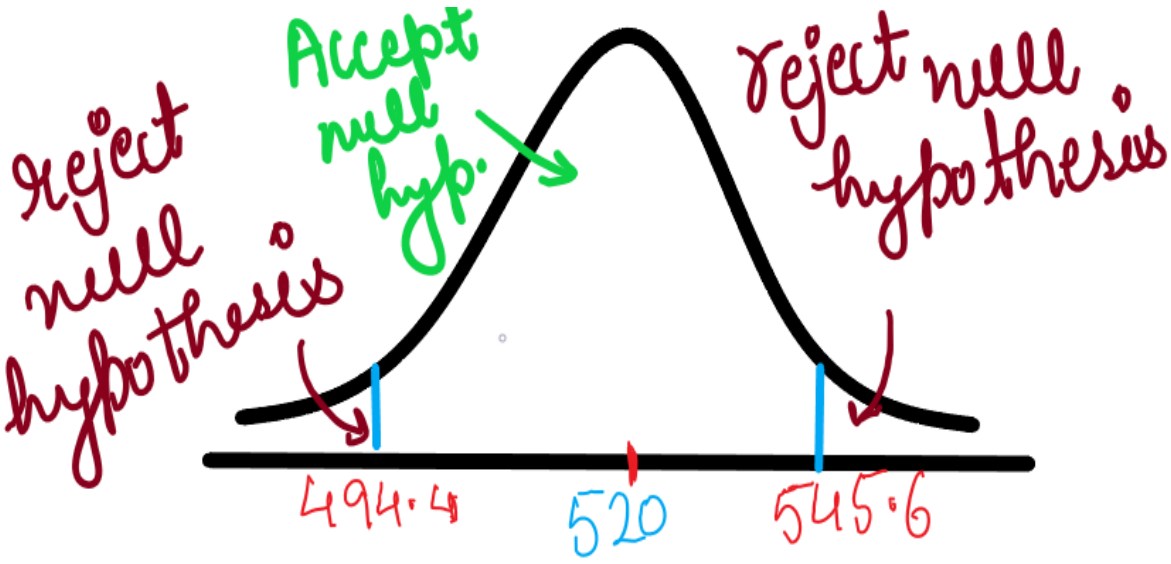
Lower fence $= \bar{x} - Z_{\alpha/2}(\sigma/\sqrt{n})$

$= 520 - 1.28 \times (100/\sqrt{25})$

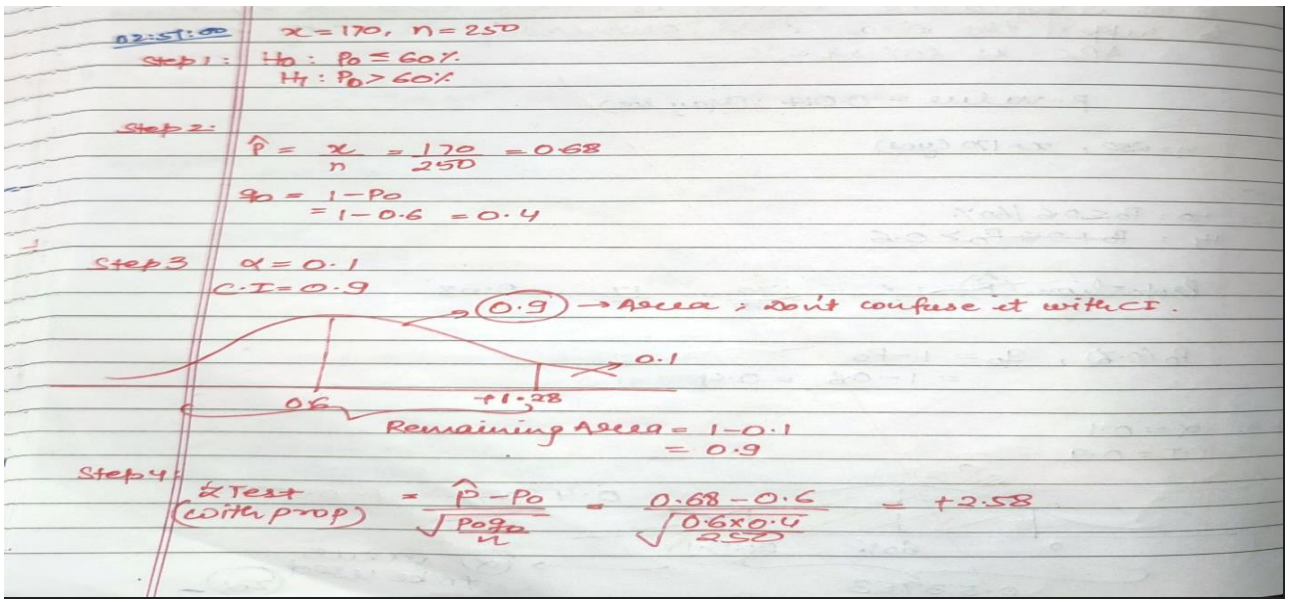
$= 494.4$

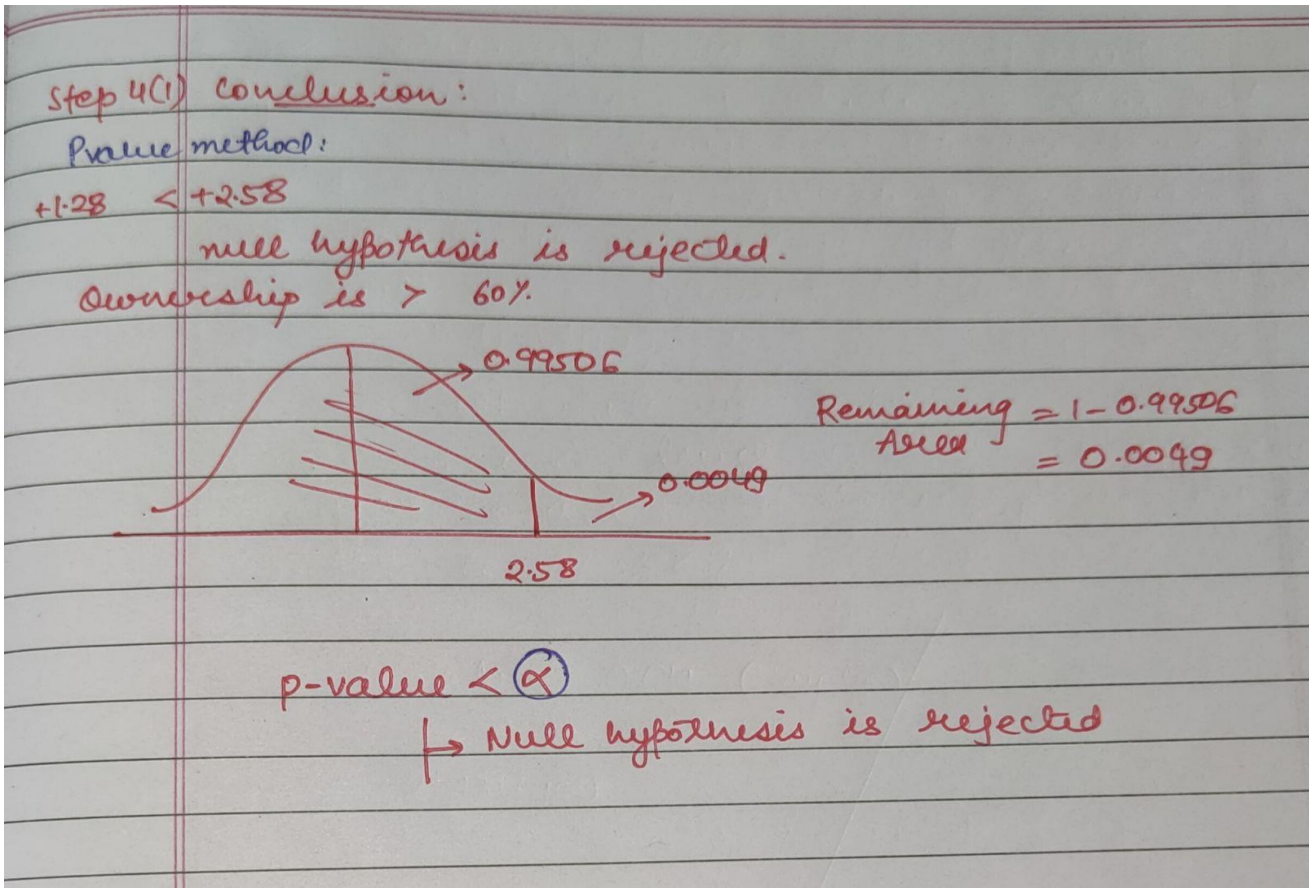
Higher fence $= 520 + 1.28 \times \left(\frac{100}{\sqrt{25}}\right)$

$= 545.6$



Solution 3


02:57:00
x = 170, n = 250
Step 1:
H0 : P0 ≤ 60%
H1 : P0 > 60%
Step 2:
p̂ = x/n = 170/250 = 0.68
q0 = 1 − P0
= 1 − 0.6 = 0.4
Step 3
α = 0.1
C.I = 0.9
0.9
→ Area ; Don't confuse it with C.I.
0.1
0.6
+1.28
Remaining Area = 1 − 0.1
= 0.9
Step 4:
Z Test (with prop) = (p̂ − P0) / √(P0q0/n) = (0.68 − 0.6) / √(0.6×0.4/250) = +2.58


Step 4(1) Conclusion:
Pvalue method:
+1.28 < +2.58
null hypothesis is rejected.
Ownership is > 60%.
0.99506
0.0049
2.58
Remaining Area = 1 − 0.99506
= 0.0049
p-value < α
↳ Null hypothesis is rejected

Solution 4

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

n= 20

Value = (Percentile/100)*(n+1)

= (99/100)*(20+1)

0.99*21=20.79th index

20.79th Index is 12 …….Ans.

Solution 5