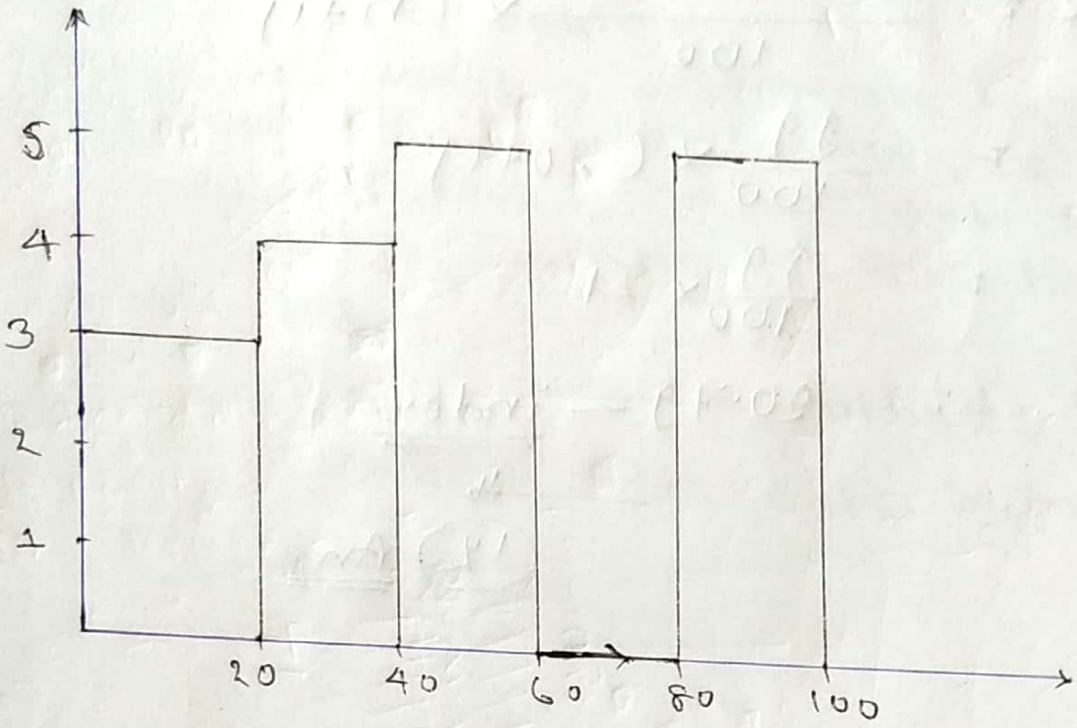
Assignment

Q1. Plot a histogram,
10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57,
88, 90, 92, 94, 99

Ans. bins: 5
bin size: 20



Assignment

Q.2 In a quant test of the CAT exam, the population standard deviation is known to be 100. A sample of 25 test taken has a mean of 520. construct an 80% CI about the mean.

Ans $\sigma = 100$ $n = 25$ $CI = 80\%$ $\alpha = 0.2$

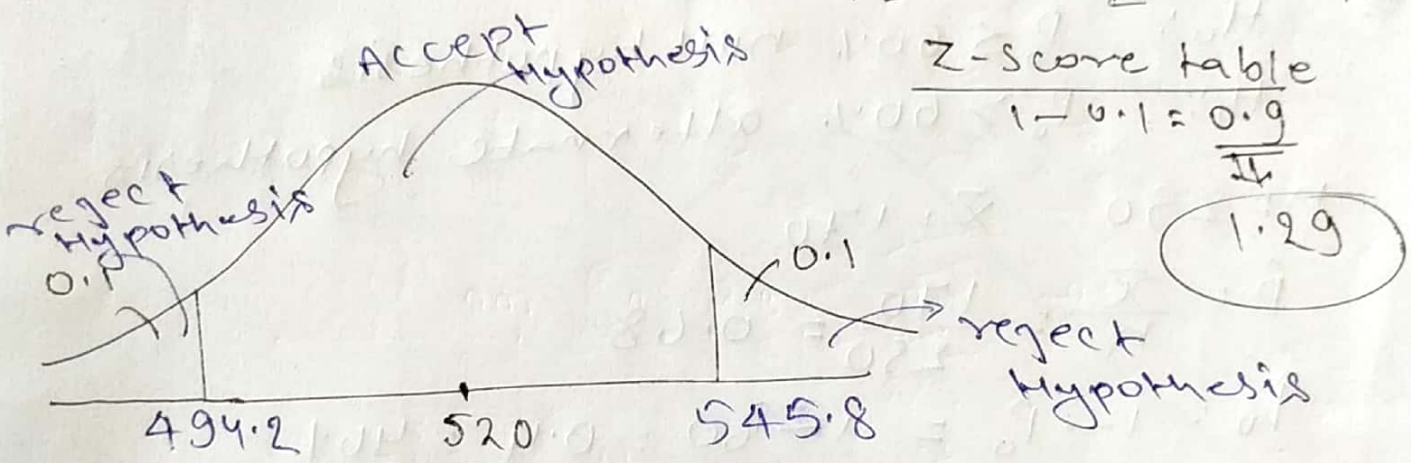
$\bar{x} = 520$

$$Z_{\alpha/2} = \frac{Z(0.2)}{2} = Z_{0.1} = 1.29$$

Z-score table

$1 - 0.1 = 0.9$

1.29



Point estimate ± margin of error

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

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

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

$= 494.2$

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

$= 545.8$

Assignment

Q.3 A car believe that the percentage of citizens in city ABC that town own a vehicle is 60% or less. A sales manager disagree with this. He conducting a hypothesis testing surveying 250 residents and found that 170 residents respond to yes owning a vehicle.

(a) State the null & alternate hypothesis

(b) At a 10% significance value, is there enough evidence to support the idea that vehicle owner in ABC town is 60% or less.

Ans:

H_0: $P_0 \leq 60\%$ null hypothesis

H_1: $P_0 > 60\%$ alternate hypothesis

$n = 250 \quad \bar{x} = 170$

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

$q_0 = 1 - P_0 = 1 - .60 = 0.4 = 40\%$

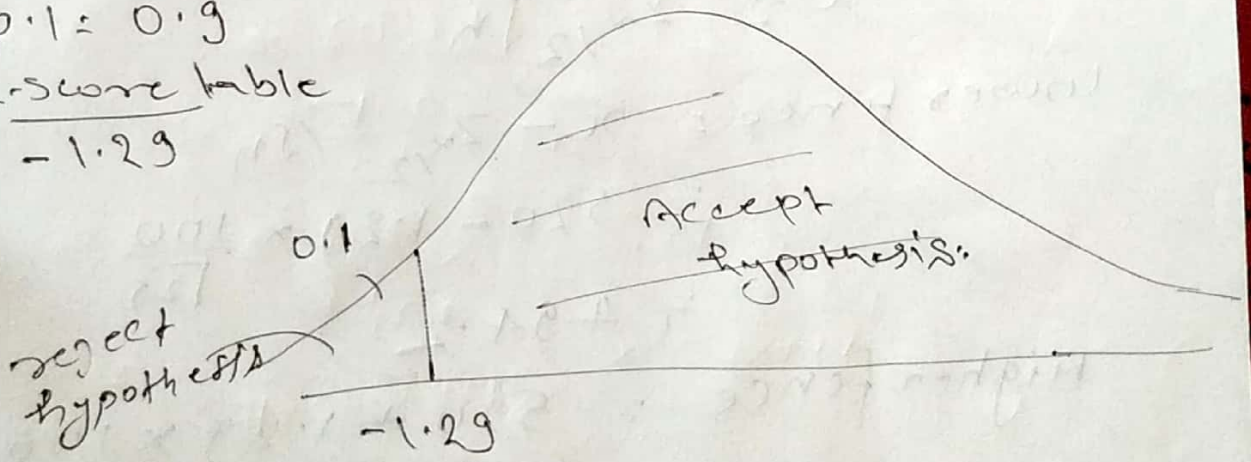
$\alpha = 0.1$

$1 - 0.1 = 0.9$

2-score table

-1.29

1-tail test



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

$= 2.58$

$2.58 > -1.29$

Accept the null hypothesis

Assignment.

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

Ans:

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

$$= \frac{99}{100} \times (20+1)$$

$$= \frac{99}{100} \times 21$$

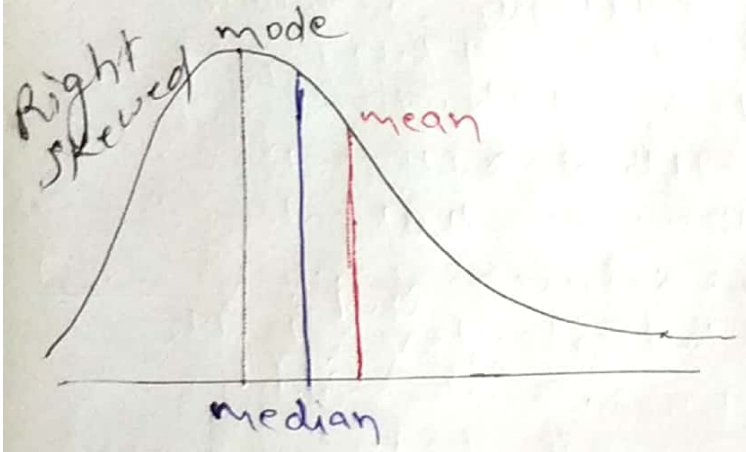
$$= 20.79 \text{ — index}$$

$$\approx 21$$

(12) Ans

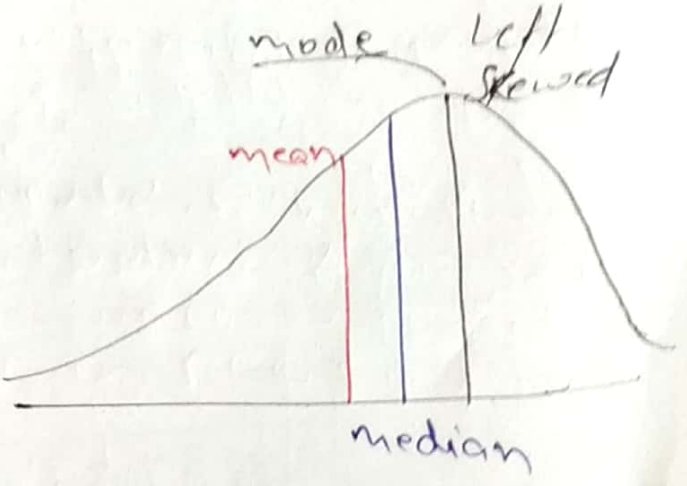
Assignment

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



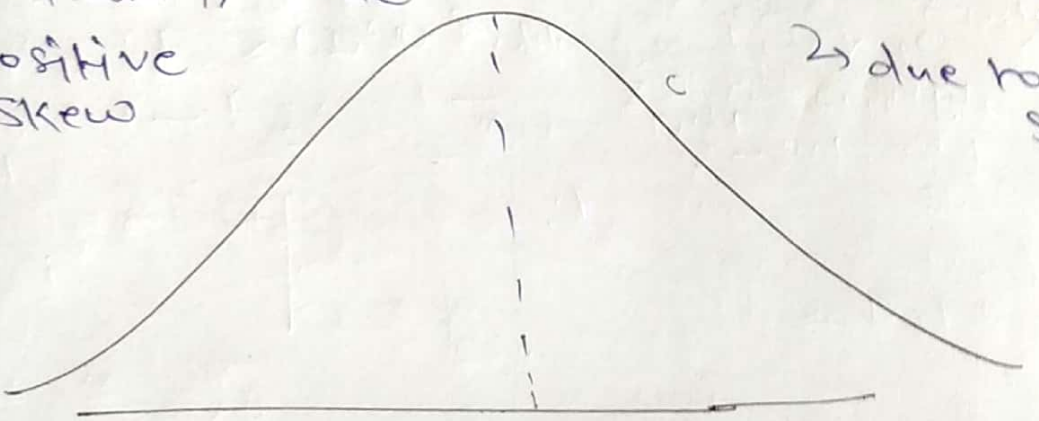
mean > median > mode

↳ due to positive skew



Mode > median > mean

↳ due to -ve skew



mean
median
mode
} all are same.