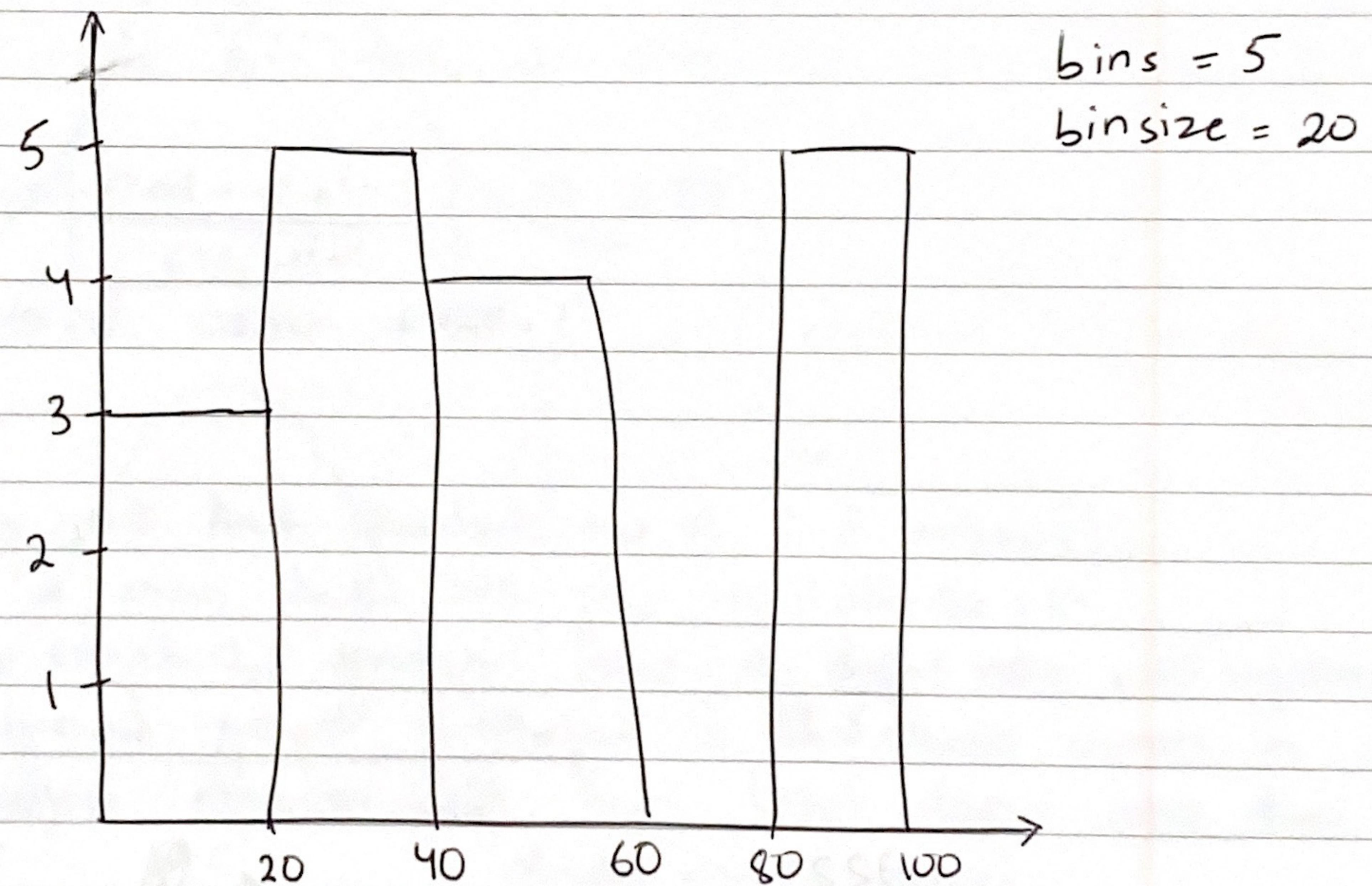


Question 1 : Plot a histogram

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



Question 2 : In a quant test of the CAT exam, the σ is known to be 100. A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the mean.

$$\sigma = 100 \quad n = 25 \quad \bar{x} = 520 \quad \alpha = 0.2$$

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

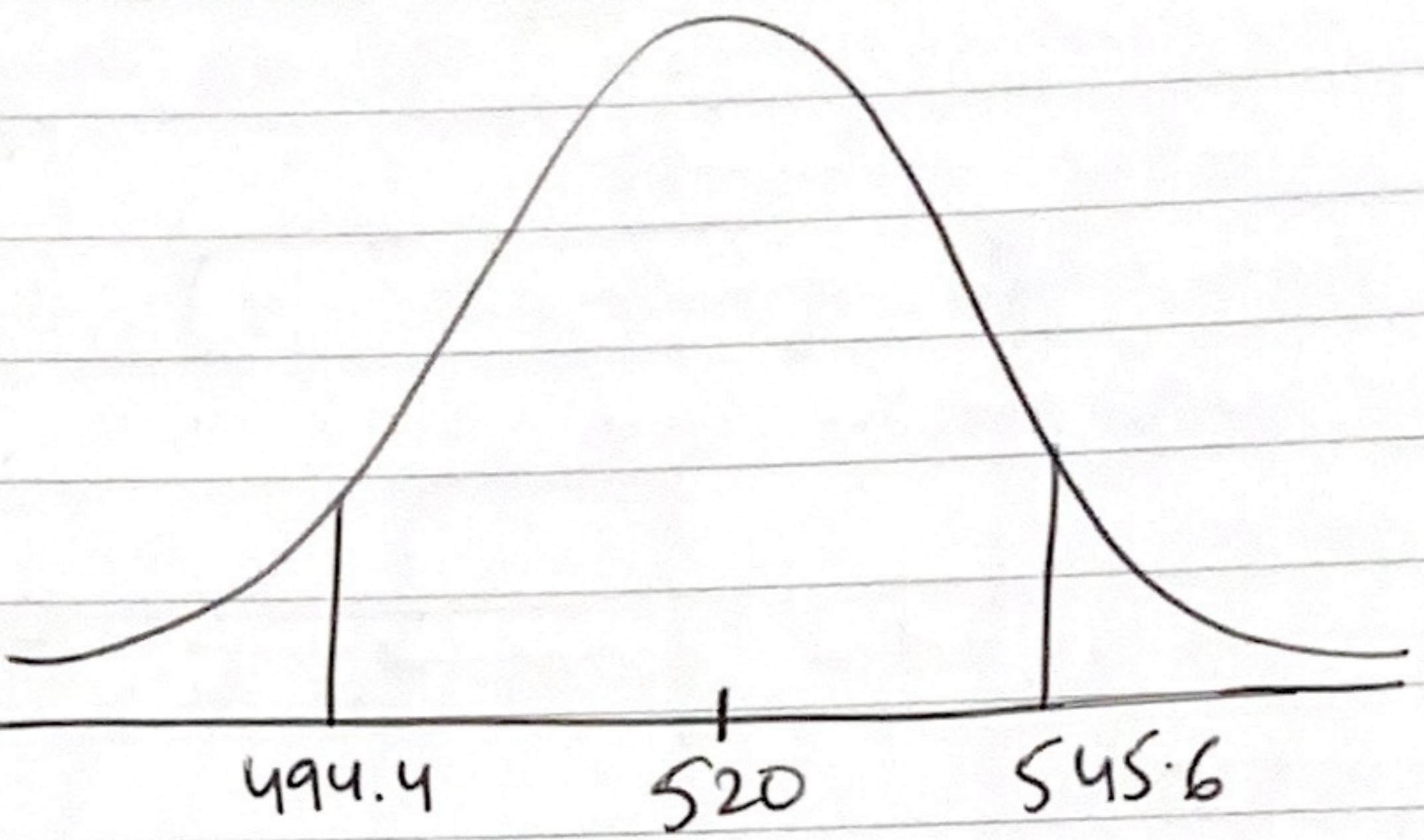
$$Z_{\alpha/2} = Z_{0.1} \\ \Rightarrow 1.28$$

$$\text{lower fence} = 520 - 1.28 \frac{100}{\sqrt{25}}$$

$$\text{higher fence} = 520 + 1.28 \frac{100}{\sqrt{25}}$$

$$\text{lower fence} = 494.4$$

$$\text{higher fence} = 545.6$$



Question 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 and found that 170 residents responded yes to owning a vehicle.

- state null and alternate hypothesis
- At a 10% α , is there enough evidence to support the idea that vehicle owners in ABC city is 60% or less.

$$a) H_0 = p_0 \leq 60\%$$

$$H_1 = p_0 > 60\%$$

$$b) n = 250 \quad x = 170$$

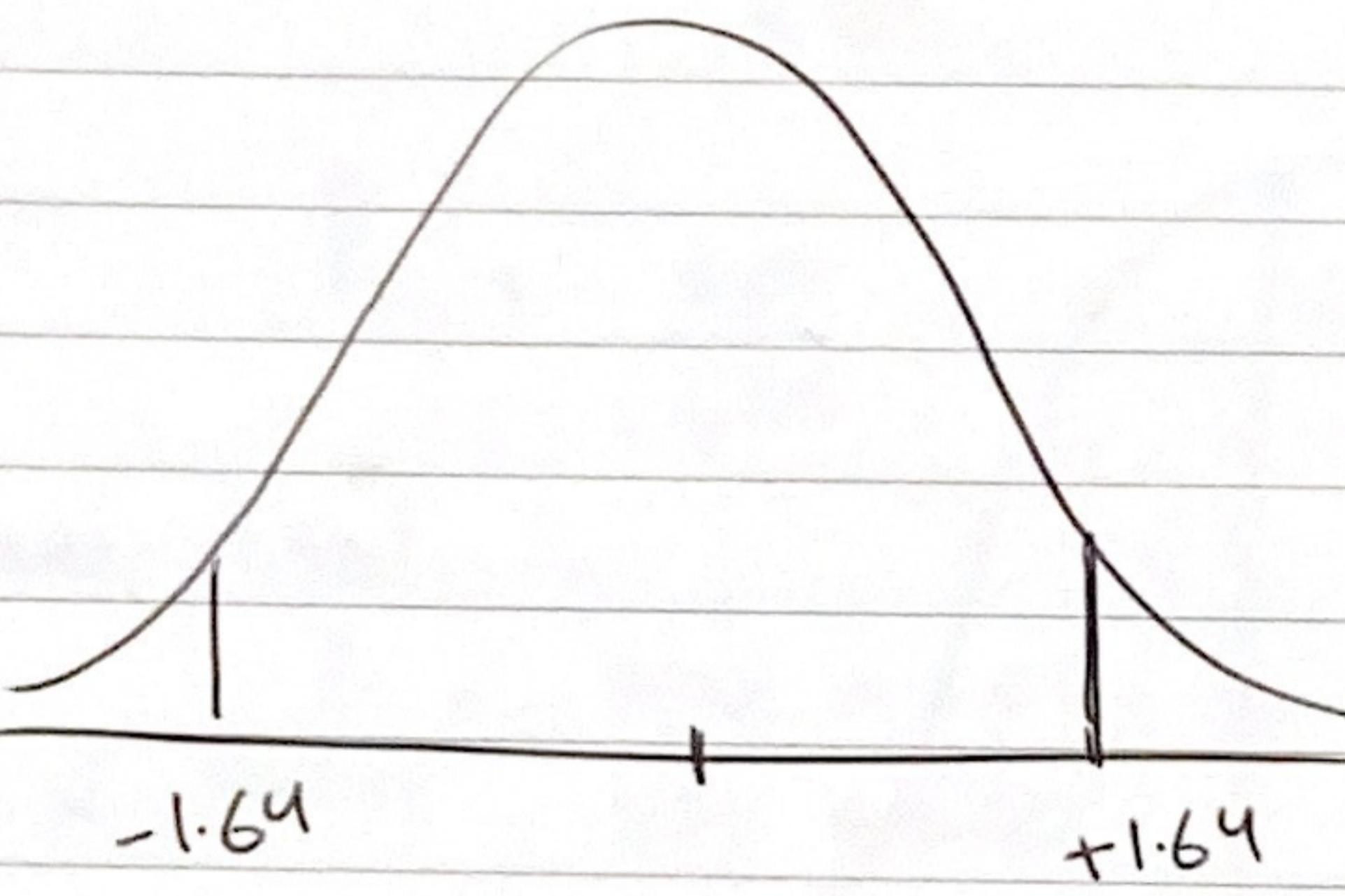
$$\hat{p} = \frac{170}{250} = 0.68$$

$$q_0 = 1 - p_0 = 0.4$$

$$\alpha = 0.1$$

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

$$= \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} \Rightarrow 2.58$$



$$2.58 > 1.64$$

Reject the null hypothesis
The vehicle owners in
ABC city is more than
60%.

Question 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

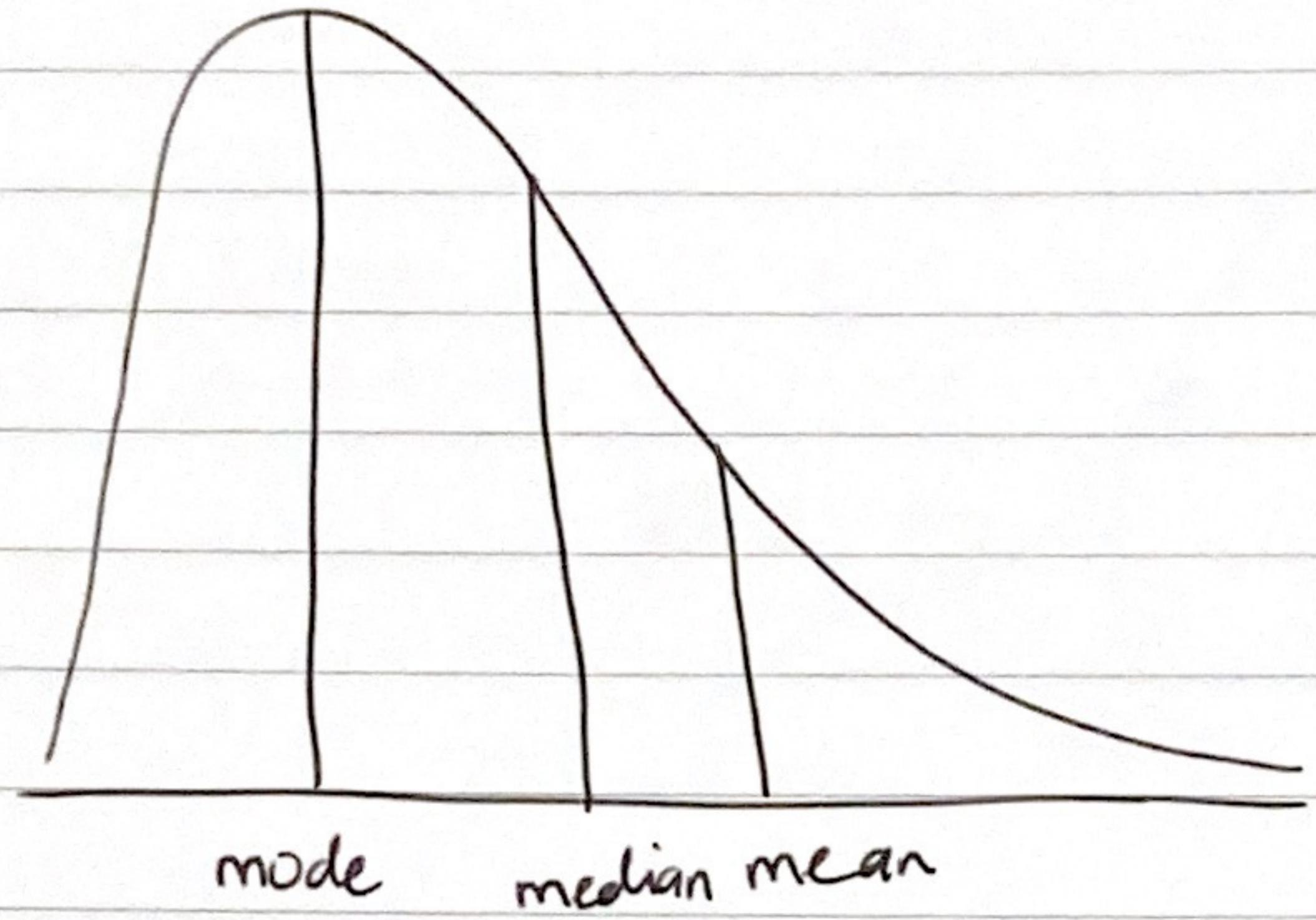
$$\text{Value} = \frac{\text{Percentile}}{100} \times n+1$$

$$= \frac{99}{100} \times (20+1) = 20.79^{\text{th}} \text{ index}$$

$$99^{\text{th}} \text{ percentile} = 12$$

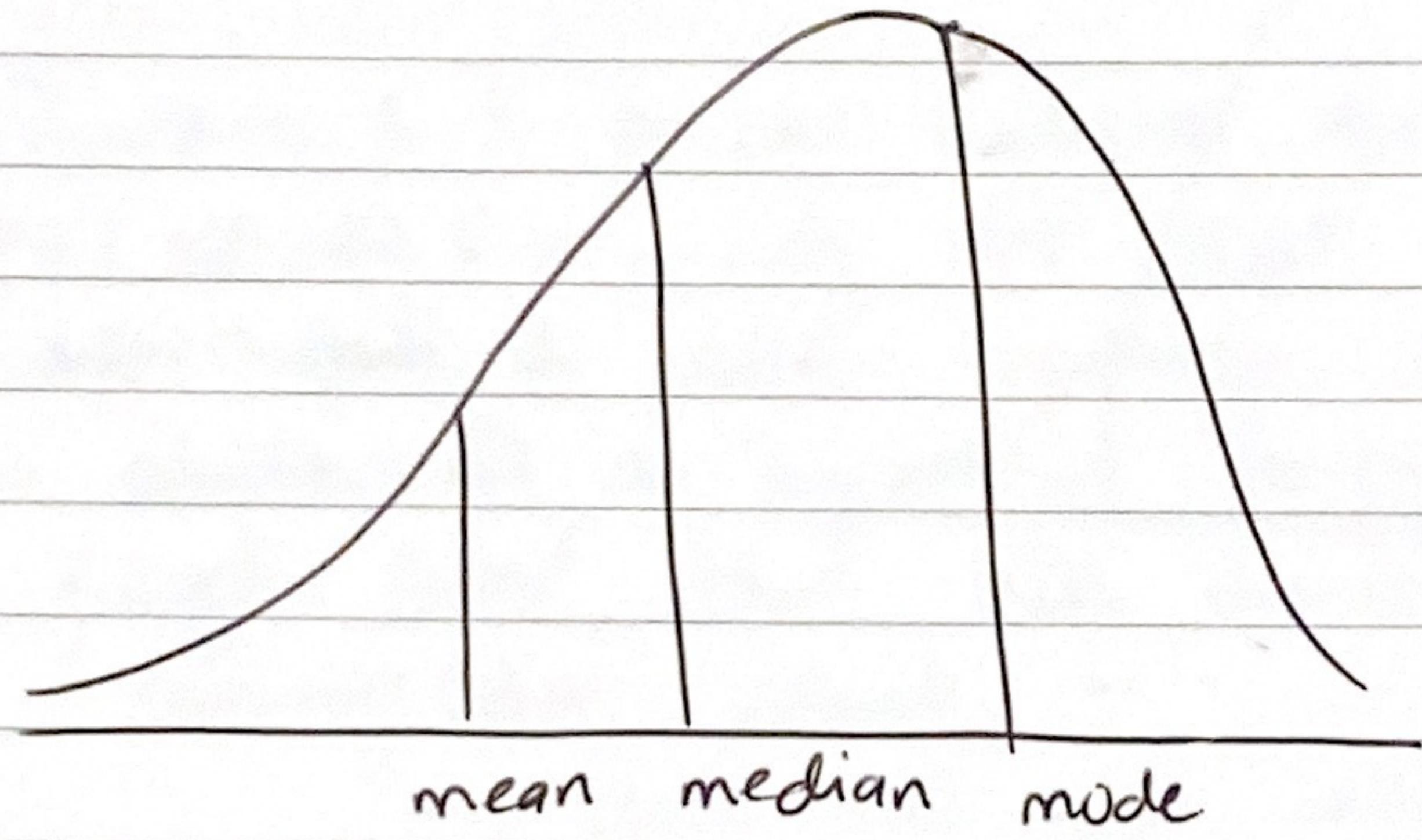
Question 5: In left and right skewed data, what is the relationship between mean, median and mode?

Tshirt



Right skewed data

mean > median > mode



left skewed data

mode > median > mean

How
for