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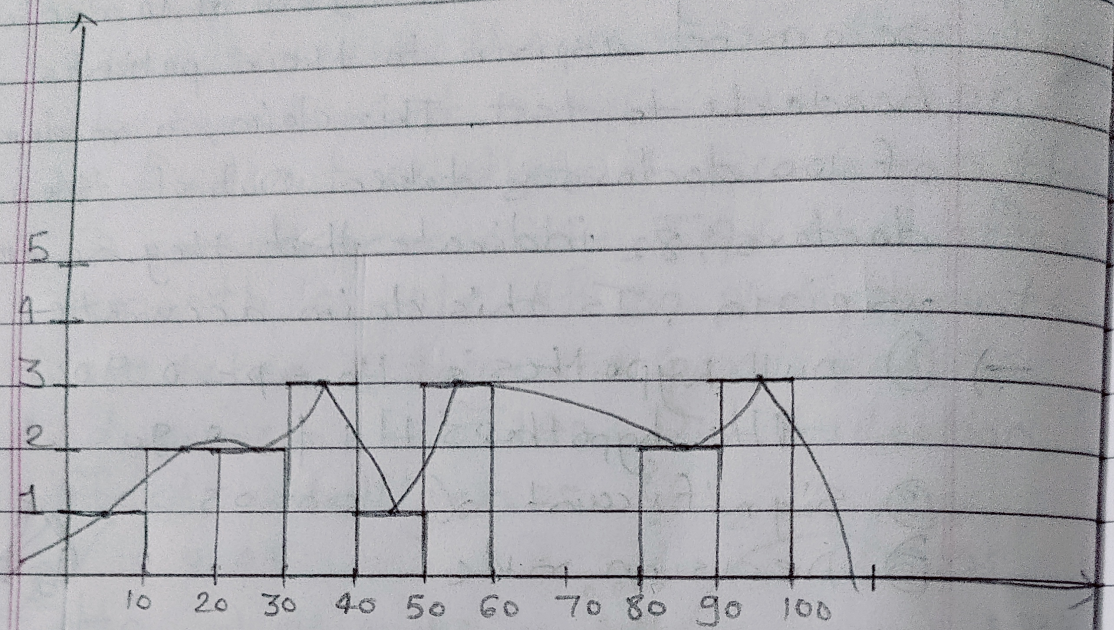
Q1.



Q2.

→ We want to create a 80% CI. That means we have an alpha of 0.20 (20%) which is split into two equal tails. This 10% refers to the value we look up in the t-table in order to find the t-score we need to plug into the equation.

A sample of 25 test-takers has a mean of 520 with a standard deviation of 100.

Because we are using the t-distribution first we must calculate degree of freedom.

$$df = n - 1 = 25 - 1 = 24$$

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$t = 2.4922$

$$\bar{x} \pm t_{\frac{\alpha}{2}} \left(\frac{s}{\sqrt{n}}\right)$$

$$520 - 2.4922\left(\frac{100}{\sqrt{25}}\right) = 470.156$$

$$520 + 2.4922\left(\frac{100}{\sqrt{25}}\right) = 569.844$$

After plugging everything into the equation, we find a lower bound of 470.156 & a upper bound of 569.844.

We are 80% confident that the mean SAT score between 470.156 & 569.844

Q3.

→ $H_0 : P = 0.60$

$H_a : P \neq 0.60$

$n = 250 \quad x = 170$

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

$p_0 = 0.60 \quad q_0 = 0.40$

$n\hat{p} = 250(0.68) = 170 > 10$

$n(1-\hat{p}) = 250(1-0.68) = 80 > 10$

$p_0 = 0.60 \quad x = 170, \quad n = 250$

$z \text{ score} = \frac{170 - 0.60}{250} = 0.6775$

$P(x < 170) = 0.75099$

$P(x > 170) = 1 - P(x < 170) = 0.2490$

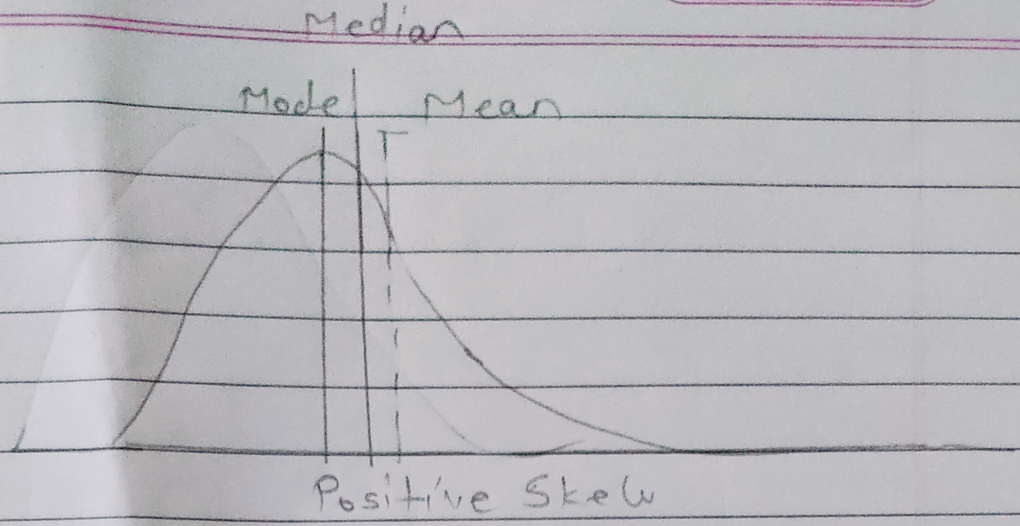
$P(.60 < x < 170) = P(x < 170) - 0.5$

$= 0.25099$

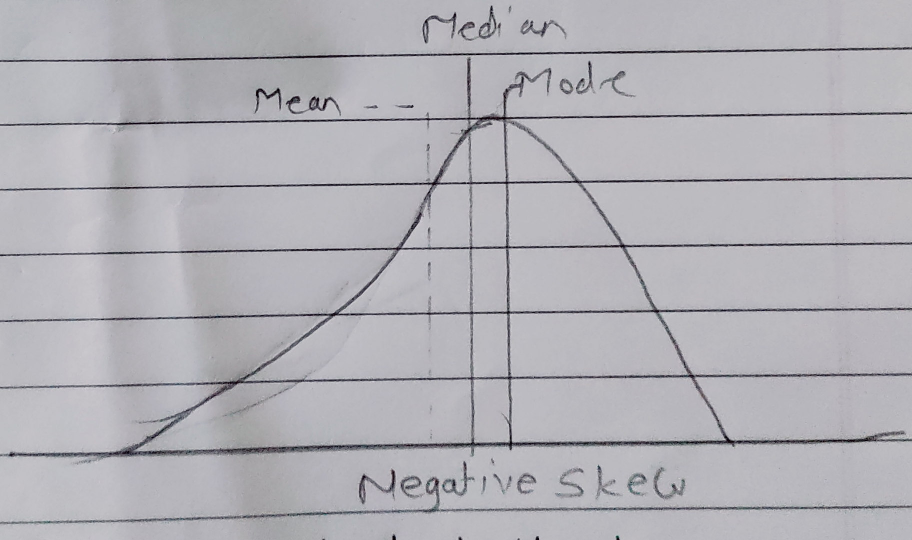
Q4. $99^{th} \text{ percentile} = \frac{99}{100} \times (20+1) = \boxed{20.79}$

$\therefore \boxed{99 \text{ percentile} = 12}$

Q5.



i) Right skewed distribution -
In right skewed distribution,
Mean > Median > Mode.
e.g. Wealth distribution.



ii) Left skewed distribution -
In left skewed distribution,
Mode > Median > Mean
e.g. Life span of human being.