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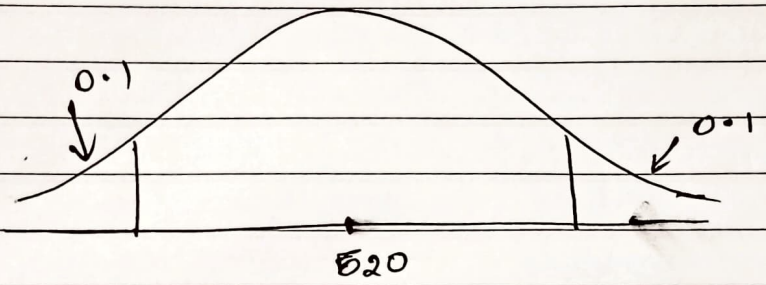
Q) In the Quant test of CAT exam the population standard deviation is known to be 100. A sample of 25 test takers has a mean of 520. Construct a 80% confidence interval (CI) about mean?

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

$\alpha = 1 - 0.8$

$= 0.2$



We Know, CI = point estimate ± margin of error

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

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

$= Z_{0.1}$

Lower fence $= \bar{x} + - Z_{0.1} \frac{\sigma}{\sqrt{n}}$

$= 520 - 1.29 \times \frac{100}{5}$

$= 520 - 25.8$

$= 494.2$

$1 - 0.1 = 0.9$

from Z score table

$= 1.29$

Higher fence $= 520 + 1.29 \times \frac{100}{5}$

$= 520 + 25.8$

$= 545.8$