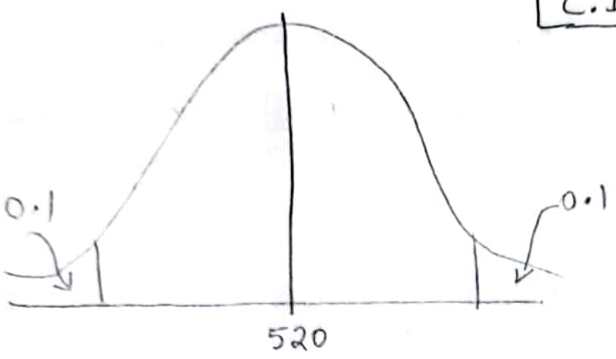
~~Home~~ Assignment (Given

Q) On the quant test of a CAT Exam, the population std. is known to be 100. A sample of 25 test takers has a mean of 520. Construct an 80% Confidence interval for the

Ans) $\sigma = 100$, $\bar{X} = 520$, $n = 25$

C.I = point estimate ± margin of error

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



Significance value (α) = 1 − 80% = 0.2

$$CI = 520 \pm Z_{\frac{0.2}{2}}\frac{100}{\sqrt{25}} \Rightarrow 520 \pm Z_{0.1}\left(\frac{100}{\sqrt{25}}\right)$$

total area = 1; so covered area = 1 − 0.1 = 0.9

on Z table = 1.29

so, $Z_{\alpha/2} = 1.29$

lower fence = $\bar{X} - Z_{\alpha/2}\frac{\sigma}{\sqrt{n}} \Rightarrow 520 - 1.29 \times 20$

$\Rightarrow 494.2$

higher fence = $\bar{X} - Z_{\alpha/2}\frac{\sigma}{\sqrt{n}} \Rightarrow 520 + 1.29 \times 20$

$\Rightarrow 545.8$