Assignment- Questions

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Q

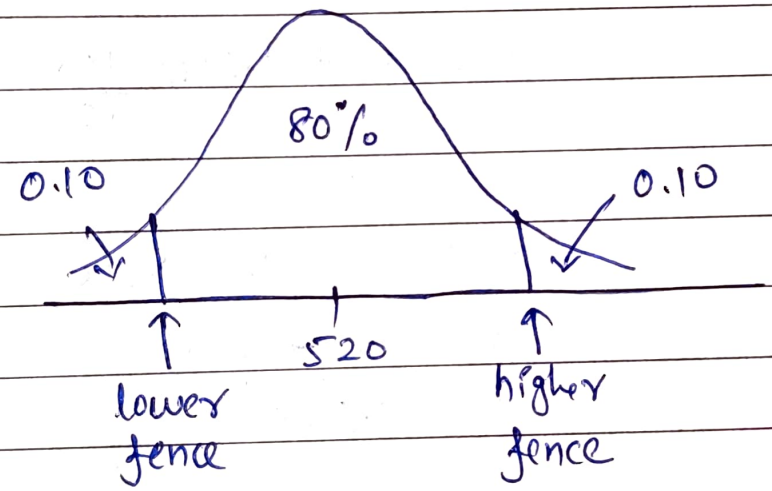
In a quant test of the CAT exam, the population standard deviation is known to be 100. A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the mean.

Sol

Given: $\sigma = 100$ $\quad n = 25$ $\quad \bar{x} = 520$

$C.I = 80\%$

$\Rightarrow \alpha = 1 - 0.80 = 0.20$



$\therefore Z_{\alpha/2} = Z_{0.20/2}$

$= Z_{0.10}$

In Z-table, search for $1 - 0.10 = 0.90$

0.09

$+1.2 \rightarrow 0.90$

Lower Fence $= \bar{x} - Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

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

$= 520 - 1.29 \times 20$

$= 520 - 25.8$

$= 494.2$

Higher Fence $= \bar{x} + Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

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

$= 520 + 1.29 \times 20$

$= 520 + 25.8$

$= 545.8$

$\therefore$ Range of C.I $= [494.2 \quad 545.8]$