Q. In a Quant test of CAT exam, the population standard deviation is 100. A sample of 25 test takers has a mean of 520. construct a 80% C.I about the mean?

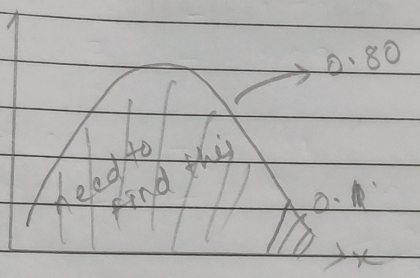
⇒ $\bar{x} = 520$, $\sigma = 100$, C.I = 80%, $n = 25$

Use z table as population std. deviation is given

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

$$\alpha = 1 - C.I$$
$$= 1 - 0.80$$
$$= 0.20$$

$$z_{\frac{0.20}{2}} = z_{0.01}$$



$1 - 0.1 = 0.90$

As under z table, we do not have value for 0.90 we take the nearest value & find z.

0.90 will be in between

of 0.89973 = 1.28 & 0.90147 = 1.29

$z = 1.28155$

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

$$= 520 - 1.28155 \left(\frac{100}{\sqrt{25}}\right)$$

$$= 494.369$$

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

$= 520 + 1.28155 \left(\frac{100}{\sqrt{25}}\right)$

$= 520 + 1.28155 (20)$

$= 545.631$