2) 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.

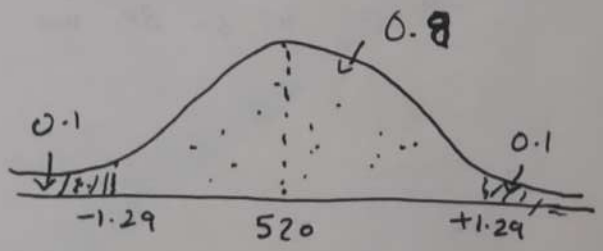
Soln: $\sigma = 100$, $n = 25$, $\bar{x} = 520$

$CI = 80\%$, $\alpha = 1 - CI = 20\%$

Margin of Error $= \frac{\sigma}{\sqrt{n}} = \frac{100}{\sqrt{25}} = 20$

$\alpha/2 = \frac{20\%}{2} = 10\% = 0.1$

$Z_{\alpha/2} = \pm 1.29$



80% CI $= \bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

$= [520 - (1.29 \times 20), 520 + (1.29 \times 20)]$

$= [494.2, 545.8]$