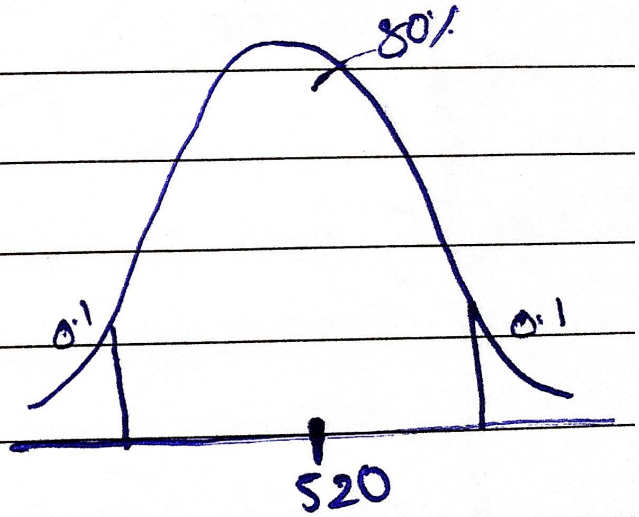
2. In a quant test of CAT Exam, the population standard deviation is known to be 100. A sample of 25 tests taken has a mean of 520. Construct 80% CI about mean.

$\sigma = 100$, $n = 25$, $\bar{x} = 520$, $\alpha = 0.1$

Point Estimate ± Margin of Error

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



$$Z_{\frac{\alpha}{2}} = Z_{\frac{0.2}{2}} = Z_{0.1}$$

$$= 1 - 0.1 = 0.9$$

$$Z_{0.1} = 1.28$$

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

$= 520 - 1.28 \left(\frac{100}{\sqrt{25}}\right)$

$= 520 - 1.28 \left(\frac{100}{5}^{20}\right)$

$= 520 - 1.28 \times 20$

$= 520 - 25.6 = 494.4.$

Higher fence $= 520 + 1.28 \left(\frac{100}{\sqrt{25}}\right)$

$= 520 + 1.28 \times 20$

$= 520 + 256$

$= 545.6$