Question

In the Quant test of CAT exam, the population standard deviation is known to be 100. A sample of 25 test takers has a mean of 520. Construct a 80% Confidence Interval about the mean ?

Answer

σ = 100, $\bar{x}$ = 520, n = 25, **Confidence Internal = 80%**

Calculate Significance level

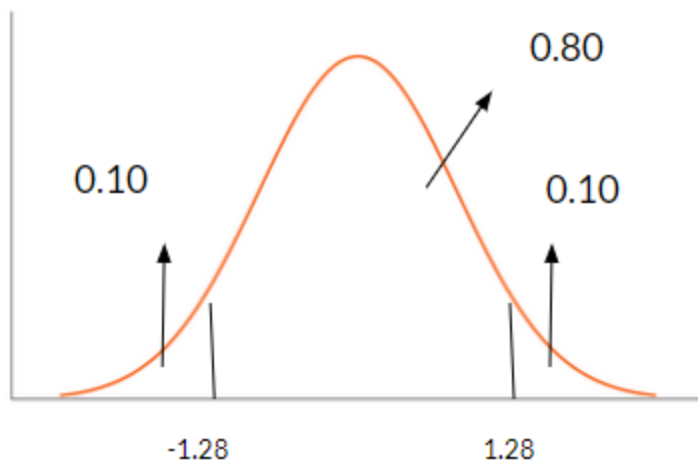Significance Value(α) = 1 - Confidence Interval

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

$$\alpha = 0.20$$

z α/2 = z 0.20/2 = z 0.10
1 - 0.10 = 0.90
Therefore, from the z table(if population standard deviation is given)value is 1.28
z α/2 = 1.28

Lower Fence = $\bar{X} - z_{\alpha/2}\left(\frac{\sigma}{\sqrt{n}}\right)$

Lower Fence = $520 - 1.28\left(100/\sqrt{25}\right)$

$\qquad$ = $520 - 1.28 \times 20$

$\qquad$ = $520 - 25.6$

$\qquad$ = **494.4**

Higher Fence = $\bar{X} + z_{\alpha/2}\left(\frac{\sigma}{\sqrt{n}}\right)$

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

$\qquad$ = $520 + 1.28 \times 20$

$\qquad$ = $520 + 25.6$

$\qquad$ = **545.6**

The Lower and Higher Fence in Distribution