

# Assignment-4

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?

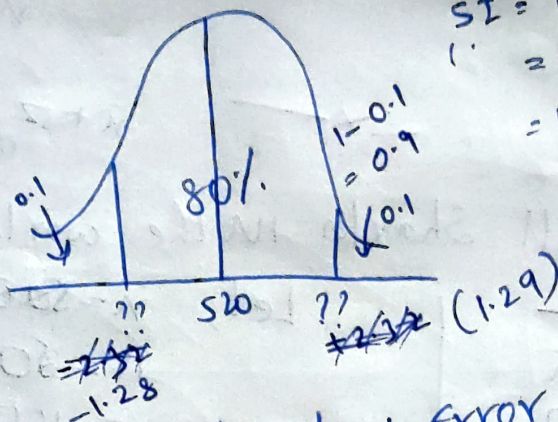
Given,

$$\sigma = 100$$

$$n = 25$$

$$CI = 80\%$$

$$\mu = 520$$



$$SI = 1 - CI$$

$$= 1 - 80\%$$

$$= 1 - \frac{80}{100} = 1 - 0.8$$

$$= 0.2$$

wkt,

$$\text{Parameter} = \text{Point Estimate} \pm \text{Error}$$

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

$$= 520 \pm z_{0.1} \frac{100}{\sqrt{25}}$$

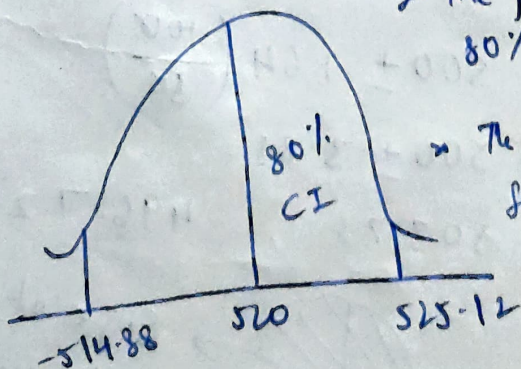
using z-table  
 $z_{0.1} \Rightarrow -2.32$

$$\text{higher fence} = 520 + 1.28(4) = 525.12$$

$$520 - 1.28(4) = 514.88$$

↑  
 lower fence

So,



\* The points which falls in 80% Accepts Null Hypothesis

\* The points which falls outside follows Alternate Hypothesis.



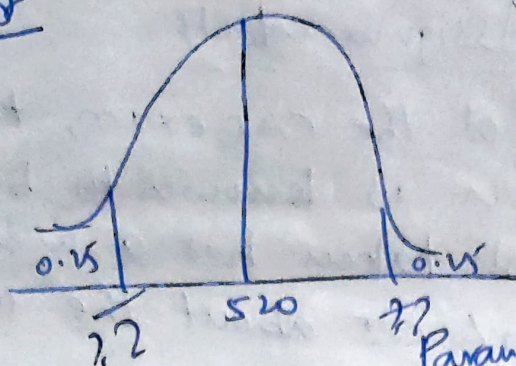
$\sigma = 100 \rightarrow z\text{-test}$

~~$\mu = 25$~~

$\mu = 520$

$n = 25$

$CI = 95\%$



$$SI = 1 - CI \\ = 1 - \frac{95}{100} = 0.05$$

Parameter = Point Est. + error

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

$$\bar{x} \pm z_{0.05} \frac{100}{\sqrt{25}}$$

Q) Size of all sharks in the world?

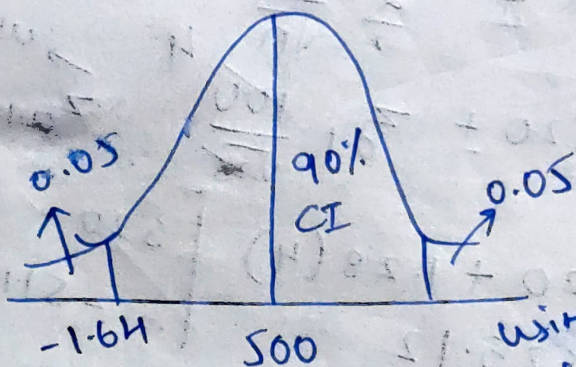
Assume,  
 $\sigma$   
 $\bar{x}$   
 $n$   
 $CI$

Let,  $\bar{x} = 500$

$n = 30$

$\sigma = 100$

$CI = 90\%$



$$SI = 1 - CI \\ = 1 - 0.9 \\ = 0.1$$

using  
 $z$  table

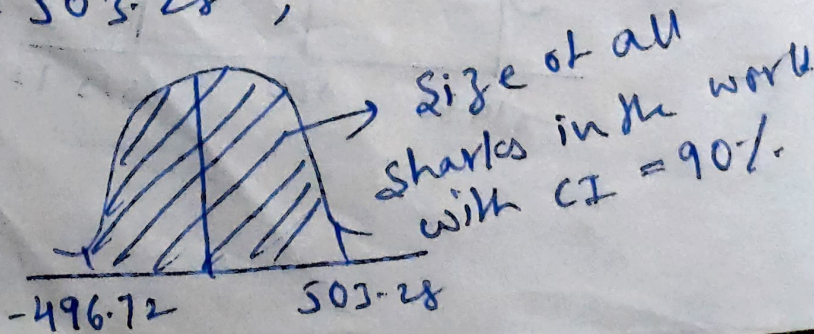
(-ve) find 0.05  
 $z = -1.64$

using  $z$  table  
 (ve) find 0.05  
 $= +1.65$

Higher Parameter =  $500 \pm 1.64 \left( \frac{100}{\sqrt{30}} \right)$

$$= 500 \pm 3.28$$

$$= 503.28, -496.72$$





Q) In a company there are 100k employees. You need to order them large and XL-Tshirts. In 500 sample data 300 XL and 200 L. Find number of T-shirts need to order?

$$\begin{aligned} X_1 &= 100K \\ X_2 &= 500 \end{aligned}$$