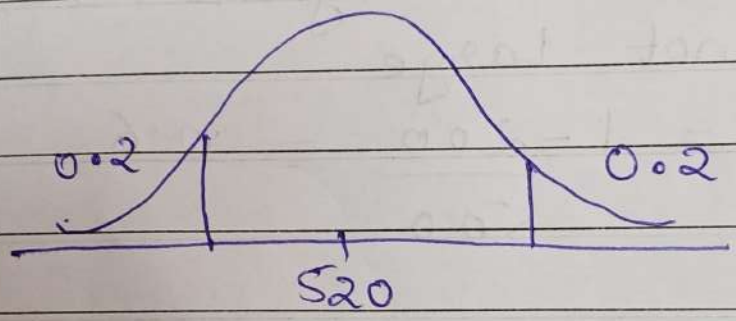
Assignment 1

In a Quent test of CAT exam, the Population standard deviation is ~~Known to~~ Known to be 100. A Sample of 25 test takers has a mean of 520. Construct a 80% CI about the mean.

Ans $\sigma = 100$ $n = 25$ $\bar{x} = 520$

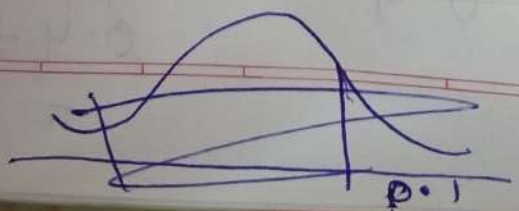


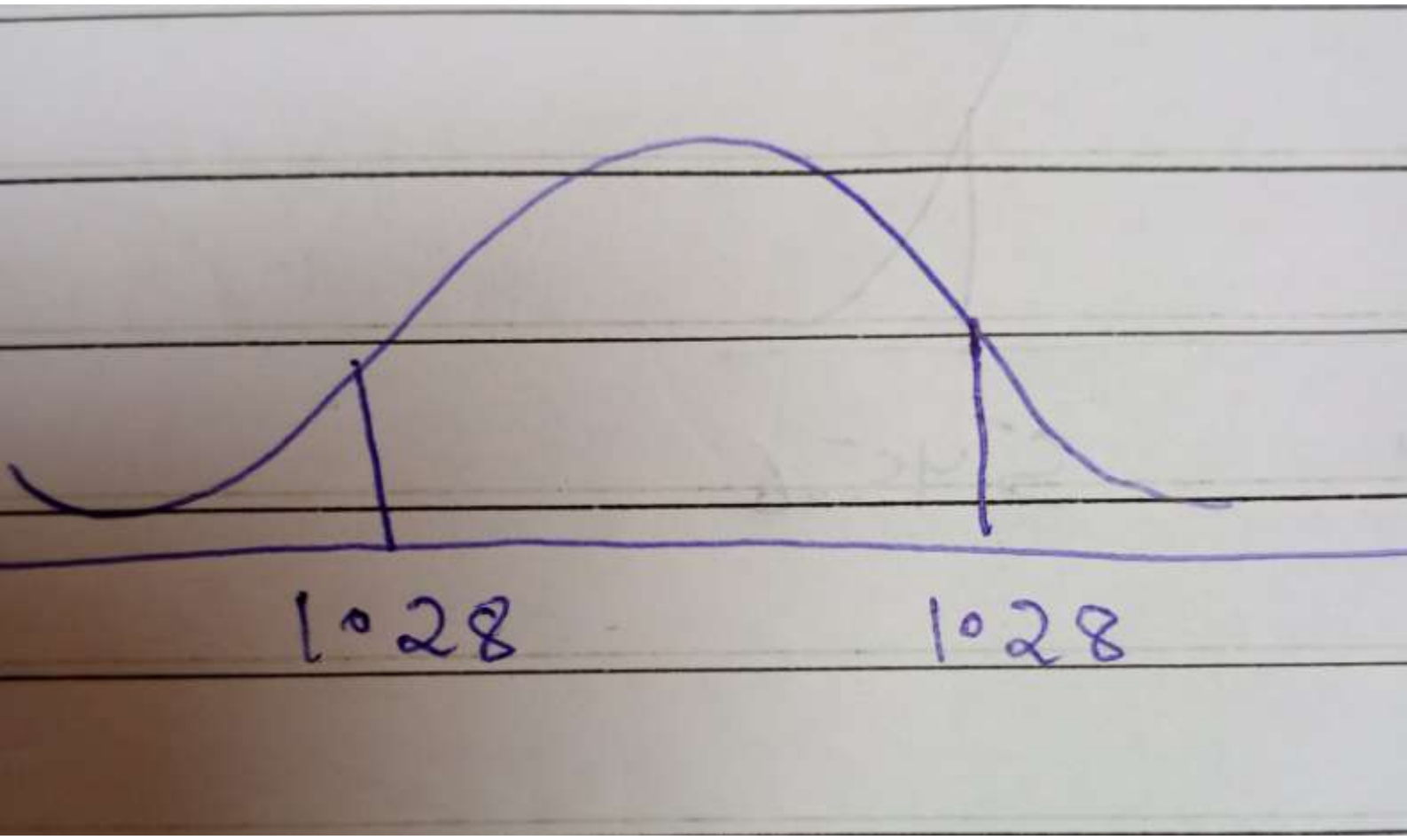
$\alpha = 1 - 80\% - 0.2$

PE ± MOE $\quad \bar{x} \pm Z_{\alpha/2} \left[\frac{\sigma}{\sqrt{n}}\right]$

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

$1 - 0.1 = 0.9$




1·28
1·28

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

$= 520 - 1.28 \frac{100}{\sqrt{25}}$

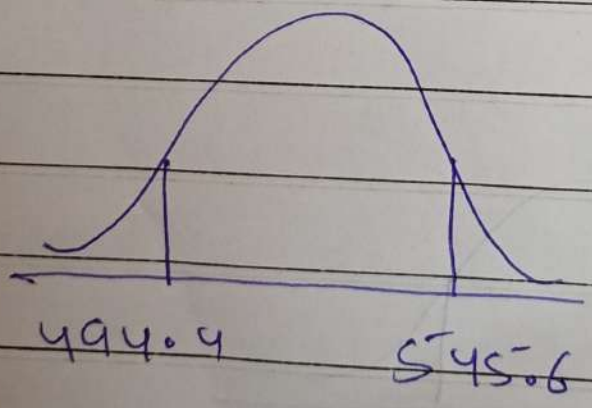
$= 520 - 1.28 \times 20$

$= 494.4$

Higher fence $\bar{x} + z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

$= 520 + 1.28 \times 20$

$= 545.6$



* Assignment – Confidence Interval 2

Suppose there are 100K employees and we want to know how many XL and L t-shirt we need to order. We have a sample of 500 employees with 300 XL and 200 L t-shirt.

Answer To Calculate 95% Confidence interval of XL t-shirts.

x = number of XL t-Shirts = 300

n = number of sample = 500

$\hat{p}$ = ~~Number~~ Proportion of XL T-Shirts $= \frac{300}{500} = 0.6$

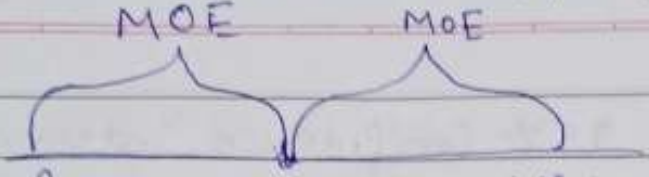
$\hat{q}$ = proportion of T-Shirts which are not XL

$= 1 - \frac{300}{500} = 0.4$

$$= Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}\hat{q}}{n}}$$

$$= 1.96 \sqrt{\frac{0.6 \times 0.4}{500}}$$

$$= 0.04294$$



Lower fence
0.6 - 0.04294 = 0.55706

0.6

Higher fence
0.64294
0.6 + 0.0429 = 0.64294

With 95% Confidence interval ~~we~~ the HR Can order XL t-Shirts between 56% to 64% .

To Calculate 95% Confidence interval of Large t-Shirts

x = number of Large t-Shirts = 200

n = number of Sample = 500

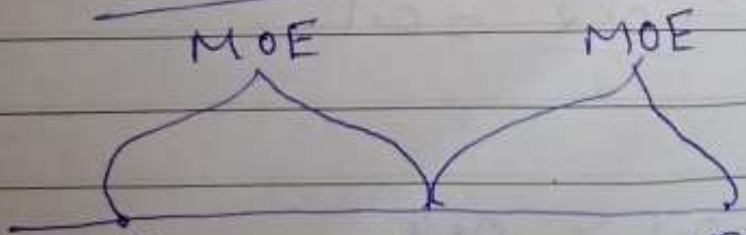
$\hat{p}$ = Proportion of L T-Shirts = $\frac{200}{500}$ = 0.4

$\hat{q}$ = Proportion of L t-Shirts which are not Large

= $1 - \frac{200}{500}$ = 0.6

$$= 1.96 \sqrt{\frac{0.4 \times 0.6}{500}}$$

$$= \underline{0.04294}$$



Lower
0.4 - 0.04294
= 0.3570

0.4

upper
0.4 + 0.04294
= 0.4429

with 95% Confidence interval we can say that the HR can order Large t-shirts between 36% to 44%.