Q. A company has 100k employee, among a sample
of 500 people → 300 people ordered Large
→ 200 people ,, XL

How many people want L and XL in the whole company
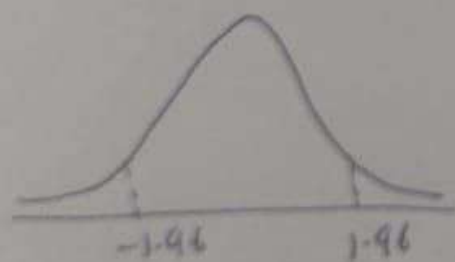or how many L & XL must be ordered for the whole
company?.

$h = 500$

Sol

$H_0 →$ Suppose ratio of large & XL required ≠ 300 : 200
→ 3 : 2

$H_q →$ Ratio of large & XL ≠ 3 : 2
⇒ Two tail z test as $h > 30$

Suppose CI = 95%, $\bar{x} = 5$, $M = 4.8$, $\sigma = 2.5$

-1.96   1.96

since CI = 95%.
$\alpha = 1 - 0.95 = 0.05$

⇒ 0.975 in z corresponds to → +1.96
→ -1.96

$z = \dfrac{\bar{x} - M}{\sigma/\sqrt{h}}$ $= \dfrac{5 - 4.8}{2.5/\sqrt{500}}$ $= \dfrac{0.2 \times \sqrt{500}}{2.5} = 1.78$

So   1.78 < 1.96 ⇒ falls under confidence interval.

→ Accept null hypothesis
→ Population ie whole company people needs L & XL
in same ratio of 3 : 2 ⇒ 60k people need Large &
40k people ,, XL