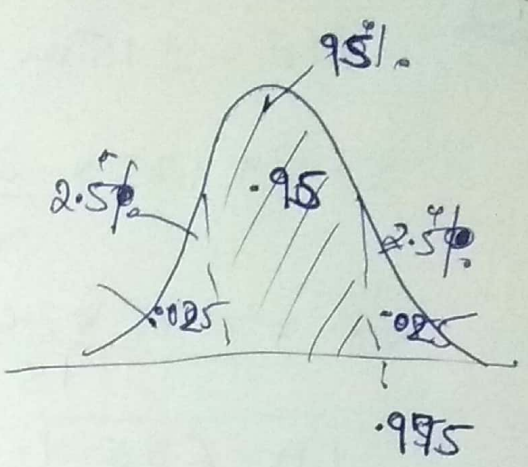
Confidence Interval Assignment.

(1) $n = 1000$

$\mu_s = 180 \quad \sigma_s = 30 =$ ~~SOEm~~

~~.975 1.64~~

~~CI = 180 ± 1.64 × 30~~



Zscore of Area(.975) = 1.96

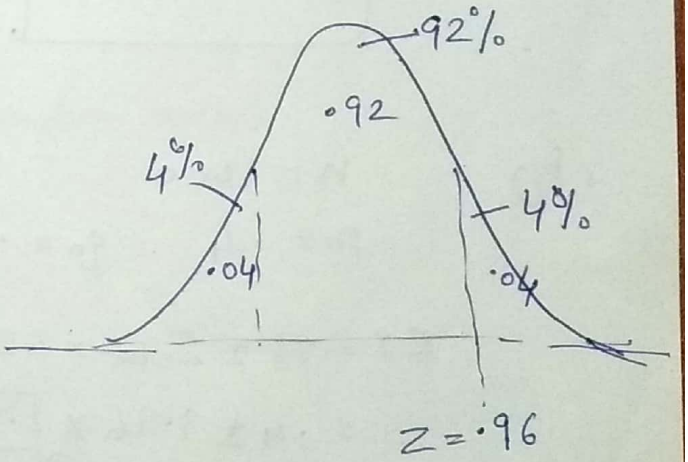
As σ_{pop} is not given therefore $\sigma_s = \sigma_{pop} = 30$

$$CI = 180 \pm 1.96 \times \frac{30}{\sqrt{1000}}$$

(2) $\sigma_{pop} = 3.6$ min

(a) $n = 120$

$\mu_s = 16.2$ min



Zscore of Area(0.96) = 1.75

$$CI = 16.2 \pm 1.75 \times \frac{3.6}{\sqrt{120}}$$

Scanned by CamScanner

2(b)

$ME = \pm 15$ sec

$$\pm 15 = + 1.75 \times \frac{3.6 \times 60}{\sqrt{n}}$$

$$\sqrt{n} = \frac{1.75 \times 3.6 \times 60}{15}$$

$$\boxed{n = 635}$$

3

(a)

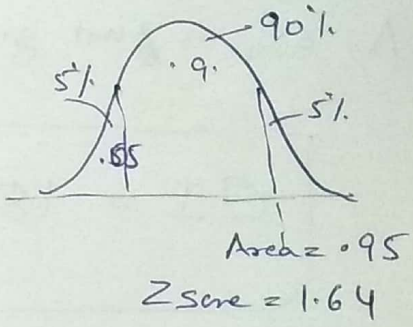
$P_0 = 0.5$, $q_0 = 0.5$

$ME = Z_{score} \times SE$

$$.02 = 1.64 \times \sqrt{\frac{0.5 \times 0.5}{n}}$$

$$n = \left(\frac{1.64}{.02}\right)^2 \times 0.5 \times 0.5$$

$$\boxed{n = 1681}$$



(b)

$n = 1000$

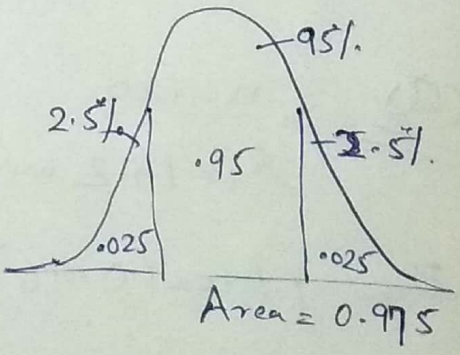
$P_0 = .4$ $q_0 = .6$

$$CI = P_s \pm Z_{score} \times SE$$

$$= .4 \pm 1.96 \times \sqrt{\frac{.4 \times .6}{1000}}$$

$$= .4 \pm 1.96 \times 0.01549$$

$$\boxed{CI = .4 \pm 0.030}$$



Scanned by CamScanner

4 $n = 4$

$.95, \quad 1.02, \quad 1.01, \quad .98$

$$\mu = \frac{.95 + 1.02 + 1.01 + .98}{4} = 0.99$$

$$\sigma^2 = \frac{(.95 - .99)^2 + (1.02 - .99)^2 + (1.01 - .99)^2 + (.98 - .99)^2}{4}$$

$$= \frac{.0016 + .0009 + .0004 + .0001}{4}$$

$$= .00075$$

$$\sigma = .027$$

(a) 95% CI $= \mu \pm 1.96 \times \sigma$

$= .99 \pm 1.96 \times .027$

(b) Yes,

Lot of variation of sample data from mean.

Scanned by CamScanner

5

$\mu_{pop} = 45$ s. $\quad \mu_s = 49.2 \quad \sigma_s = 3.5$ s

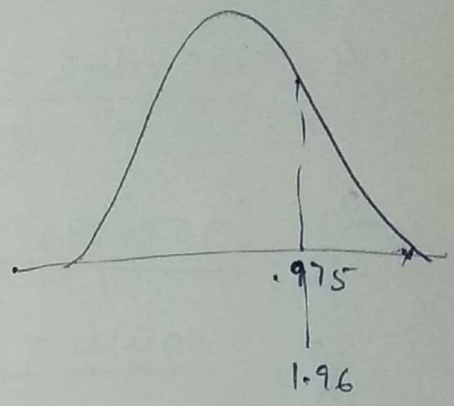
$n = 9$

Null → Mean change

Alternate → No change

SI = 5% ⇒ CL = 95%

$Z_{score} = 1.96$



$$Z_{score} = \frac{49.2 - 45}{3.5/\sqrt{9}} = 3.6$$

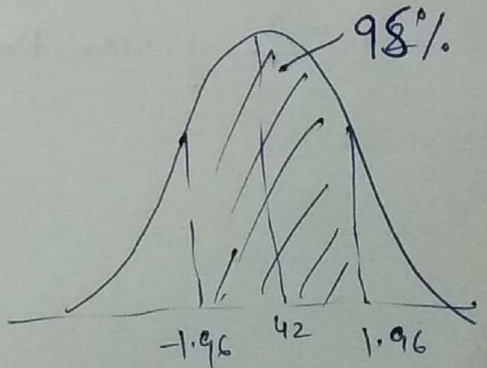
Reject the Null Hypothesis.

6

$\sigma = 5m$

$n = 64$

$\mu = 42m$



$$CI = \mu \pm 1.96 \times \frac{5}{\sqrt{64}}$$

$$= 42 \pm 1.96 \times \frac{5}{\sqrt{64}}$$

Scanned by CamScanner

7

$n = 17$

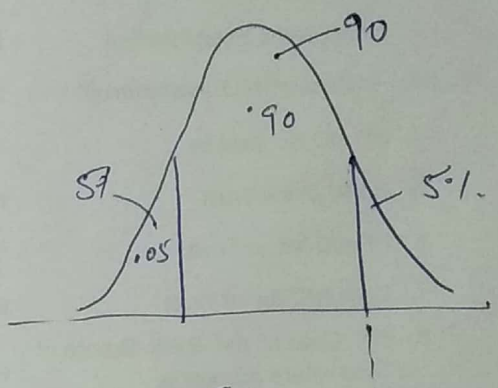
$\sum d_i = -3.5$

$\sum \sum d_i^2 = 19.13$

$\sigma^2 = \frac{19.13}{17} =$

$\sigma = 1.06$

$\mu = \frac{-3.5}{17} = -.205$



Zscore = 1.64

$$90\%\ CI = -.205 \pm 1.64 \times \frac{1.06}{\sqrt{17}}$$

8

Var = 9 cm = σ^2

$\sigma = 3$

$\mu = 0$

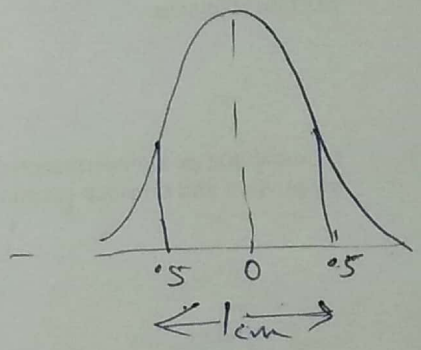
$$95\%\ CI = \mu \pm Z \cdot SE$$

$$1 = 0 \pm 1.96 \times \frac{3}{\sqrt{n}}$$

$$\sqrt{n} = 1.96 \times 3$$

$$n = 34.5$$

$$\simeq 35$$



Mean = $\frac{1}{2} = .5$

Scanned by CamScanner

9

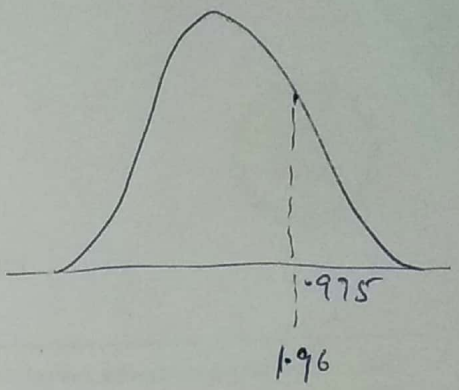
$\sigma_{pop} = 150$

$n = 16$

$\mu_s = 141\$$

$\sigma = 4$

$CI = 95\%$ $Z_{score} = 1.96$



$$Z_{score} = \frac{141 - 150}{4/\sqrt{16}} = -9 = Z_c$$

$$t_{(.975, 15)} = 2.13$$

$$141 \pm 2.13\left(4/\sqrt{16}\right)$$

$$\boxed{141 \pm 2.13}$$

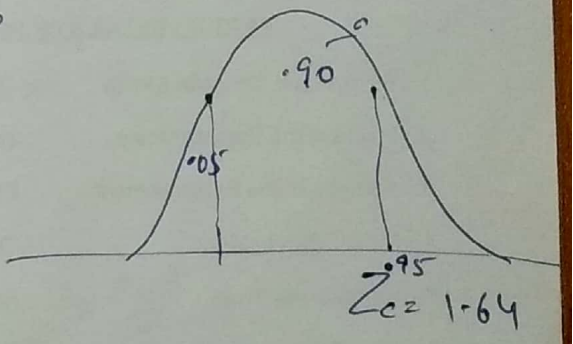
10

$n = 17096$ $\quad \hat{P} = p_s = \frac{3314}{17096} = .193$

$s = 3314$

$Z_{score} \simeq 90\%$

$Z_c = 1.64$



$$SE = \sqrt{\frac{p_s \times q_s}{n}}$$

$$= \sqrt{\frac{(.193)(1 - .193)}{17096}}$$

$$= .003$$

$$CI \Rightarrow \quad 0.193 \pm 1.64 \times (.003)$$

$$\boxed{0.193 \pm .004}$$

Scanned by CamScanner