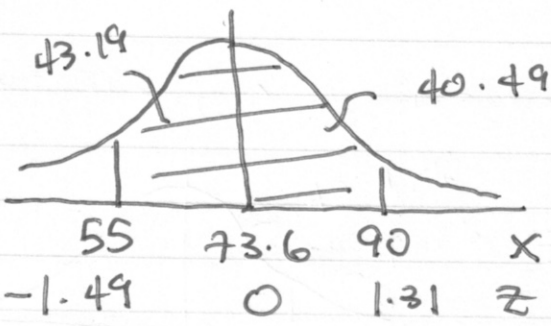
## Answer Sheet

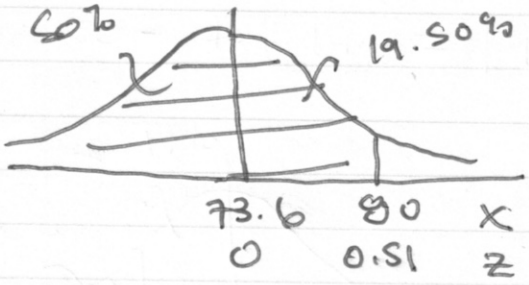
| | | | |
|---|---|---|---|
| 1 | 9.5% | 15 | 0.12 |
| 2 | 24.5% | 16 | $0.513 < p < 0.753$ |
| 3 | 93.2% | 17 | 4269 |
| 4 | 83.7% | 18 | $\mu = 5$ |
| 5 | 69.5% | 19 | $\pm 1.96$ |
| 6 | 94.2 | 20 | 6.50 |
| 7 | 65.2 | 21 | The sample does not support the claim |
| 8 | 1.13 | 22 | $p \leq 0.45$ |
| 9 | $21.47 < \mu < 23.73$ | 23 | 2.33 |
| 10 | 38 | 24 | $-0.28$ |
| 11 | 0.64 | 25 | The sample supports the claim |
| 12 | $4.86 < \mu < 6.14$ | 26 | solutions |
| 13 | $1.1 < \sigma^2 < 4.9$ | 27 | |
| 14 | $1.0 < \sigma < 2.2$ | 28 | |

④




$43.19 + 40.49 \approx 83.68\% \approx \boxed{83.7\%}$

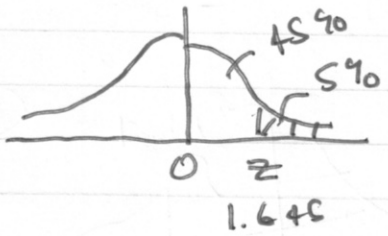
⑤




$$Z = \frac{80 - 73.6}{12.5}$$

$50 + 19.50 = 69.50\% \approx \boxed{69.5\%}$

⑥ $X = \mu + Z \cdot \sigma$ ; $X = 73.6 + 12.5\,Z$

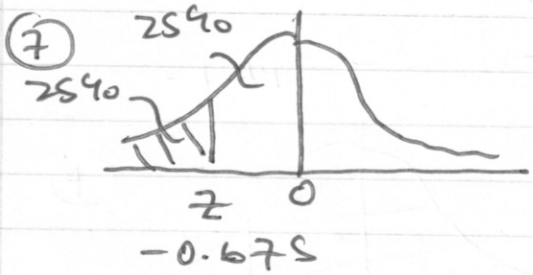



$Z \approx 1.645$

$X \approx 73.6 + 12.5 \cdot 1.645$

$X \approx \boxed{94.2}$

⑦




$X \approx 73.6 + 12.5Z$

$Z \approx -0.675$

$X \approx 73.6 - 12.5 \cdot 0.675$

$X \approx \boxed{65.2}$

(8) $\bar{x} - E < \mu < \bar{x} + E$

$E = z_{\alpha/2} \frac{s}{\sqrt{n}}$ ;

$E = 2.575 \cdot \frac{4.8}{\sqrt{120}}$

$E \approx 1.13$

large Sample

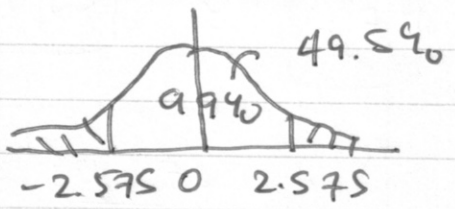
Sample

$n = 120$

$\bar{x} = 22.6$

$s = 4.8$

99% conf




(9) $22.6 - 1.13 < \mu < 22.6 + 1.13$

$21.47 < \mu < 23.73$

99% conf

(10) $n = \left( \frac{z\sigma}{E} \right)^2 = \left( \frac{zs}{E} \right)^2$

$n = \left( \frac{2.575 \cdot 4.8}{2} \right)^2$ ; $n \approx 38$

(11) $\bar{x} - E < \mu < \bar{x} + E$

$E = t_{\alpha/2} \frac{s}{\sqrt{n}}$

$E = 1.761 \cdot \frac{1.4}{\sqrt{15}}$

$E \approx 0.64$

Sample

$n = 15$ (small sample)

$\bar{x} = 5.5$

$s = 1.4$

$\alpha = 10\%$ (two tails)

note $df = 14$

$t_{\alpha/2} = 1.761$

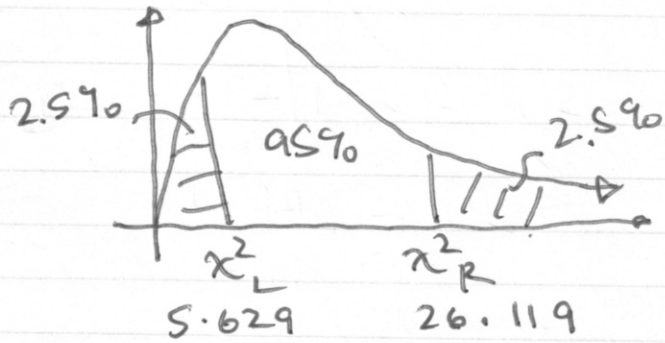
(12) $5.5 - 0.64 < \mu < 5.5 + 0.64$

$4.86 < \mu < 6.14$

90% conf

(13) $\frac{(n-1)S^2}{\chi^2_R} < \sigma^2 < \frac{(n-1)S^2}{\chi^2_L}$

$df = 14$




$\frac{14 \cdot 1.4^2}{26.119} < \sigma^2 < \frac{14 \cdot 1.4^2}{5.629}$

$1.1 < \sigma^2 < 4.9$

95% conf

(14) $\sqrt{1.1} < \sigma < \sqrt{4.9}$

$1.0 < \sigma < 2.2$

95% conf

(15) $\bar{p} - E < p < \bar{p} + E$ ; Sample

$n = 60$ (large)

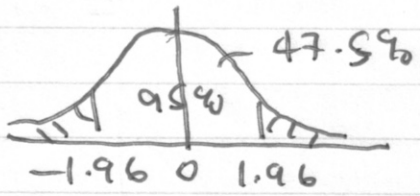
$x = 38$

95% conf

$$E = z_{\alpha/2} \sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$$

$$E = 1.96 \sqrt{\frac{0.633 \cdot 0.367}{60}}$$

$E \approx 0.12$




note $\bar{p} = \frac{x}{n}$

$\bar{p} = \frac{38}{60}$

$\bar{p} \approx 0.633$

$1 - \bar{p} \approx 0.367$

(16) ~~0.633~~ $- 0.12 < p < 0.633 + 0.12$

$0.513 < p < 0.753$

95% conf

(17) $n = \frac{z^2 \bar{p}(1-\bar{p})}{E^2}$ ; $z = 1.96$, $E = 0.015$

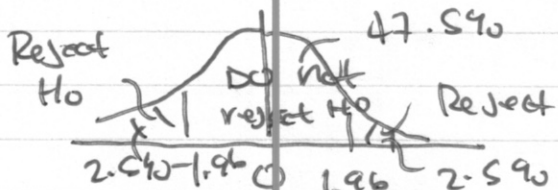
$n = 1.96^2 \cdot 0633 \cdot 0.$

$n = \frac{1.96^2 \cdot 0.5 \cdot 0.5}{0.015^2}$ ; $n \approx 4,269$

(18) $\mu = 5$ ; $H_0 : \mu = 5$ claim

$H_1 : \mu \neq 5$

(19) $\pm 1.96$



(20) $TS = \dfrac{\bar{x} - \mu}{s/\sqrt{n}}$

$TS = \dfrac{6.2 - 5}{1.6/\sqrt{75}}$

$TS \approx 6.50$

Sample

$n = 75$

$\bar{x} = 6.2$

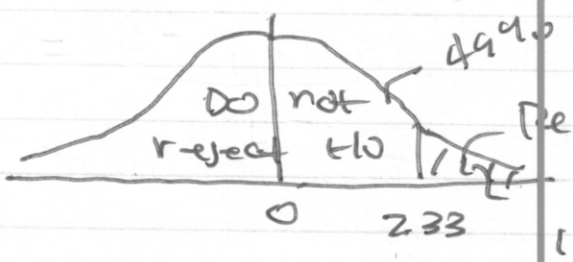
$s = 1.6$

(21) Reject $H_0$ ; The sample does not support the claim.

(22) $p \leq 45\%$ or $p \leq 0.45$

$H_0 : p \leq 0.45$ claim

$H_1 : p > 0.45$




1%

(23) CV $\neq$ 2.33

(24) $TS = \dfrac{\bar{p} - p}{\sqrt{\dfrac{p(1-p)}{n}}}$

Sample

$n = 200$

$x = 88$

$\bar{p} = \dfrac{88}{200} \approx 0.44$ ; $1 - \bar{p} \approx 0.56$

$TS = \dfrac{0.44 - 0.45}{\sqrt{\dfrac{0.45 \cdot 0.55}{200}}}$

$TS \approx -0.28$

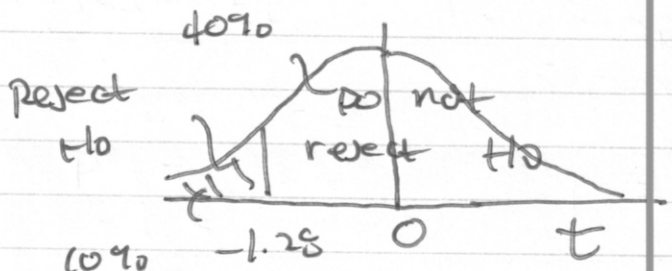
(25) Do not reject $H_0$;

The Sample supports the claim

(26) $\mu \geq 250$

$H_0 : \mu \geq 250$ claim

$H_1 : \mu < 250$




Sample

$n = 28$ (Small)

$\bar{x} = 262.45$

$s = 14.22$

(27)

$CV = -1.314$

$df = 27$

$\alpha = 10\% = 0.10$

(one tail)

t- table

(28) $TS = \dfrac{\bar{x} - \mu}{s/\sqrt{n}}$

$TS = \dfrac{262.45 - 250}{14.22/\sqrt{28}}$ ; $TS \simeq 4.633$

(29) Do not reject $H_0$;

The Sample supports the claim