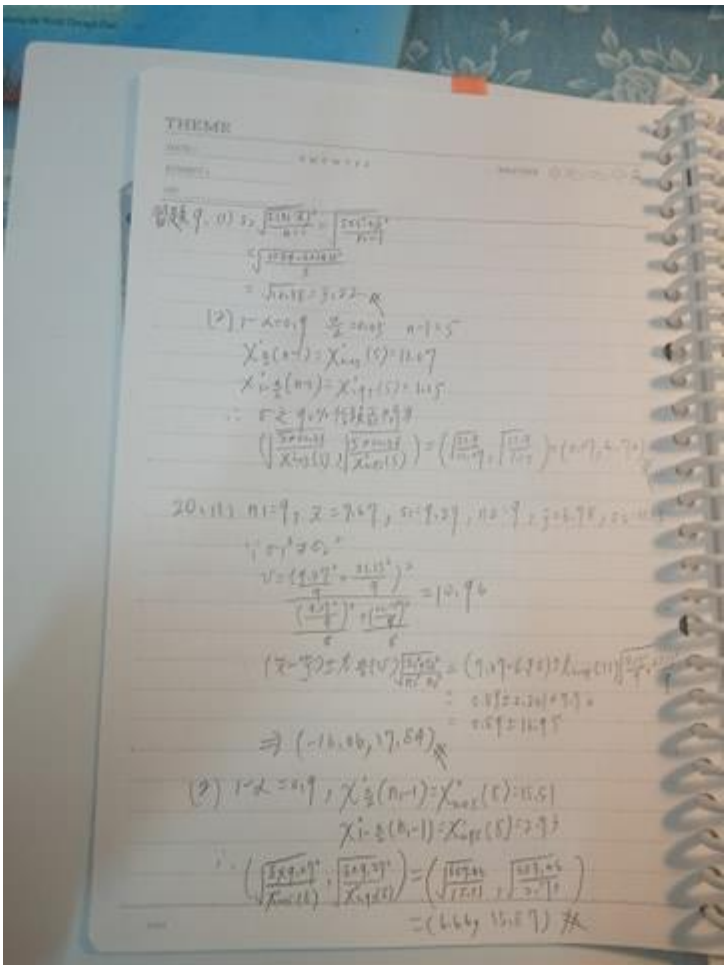


THEME

DATE: S M T W T F S

SUBJECT: WEATHER

NO:

習題9.(1) $s=\sqrt{\frac{\sum(x_i-\bar{x})^2}{n-1}}=\sqrt{\frac{\sum x_i^2-n\bar{x}^2}{n-1}}$

$=\sqrt{\frac{[illegible]}{5}}$

$=\sqrt{10.38}=3.22$ #

(2) $1-\alpha=0.9$ $\frac{\alpha}{2}=0.05$ $n-1=5$

$\chi^2_{\frac{\alpha}{2}}(n-1)=\chi^2_{0.05}(5)=11.07$

$\chi^2_{1-\frac{\alpha}{2}}(n-1)=\chi^2_{0.95}(5)=1.15$

∴ σ之90%信賴區間為

$\left(\sqrt{\frac{5\times10.38}{\chi^2_{0.05}(5)}},\sqrt{\frac{5\times10.38}{\chi^2_{0.95}(5)}}\right)=\left(\sqrt{\frac{51.9}{11.07}},\sqrt{\frac{51.9}{1.15}}\right)=(2.17, 6.72)$

20.(1) $n_1=9$, $\bar{x}=7.37$, $s_1=9.39$, $n_2=9$, $\bar{y}=6.78$, $s_2=11.15$

∵ $\sigma_1^2\neq\sigma_2^2$

$\nu=\frac{\left(\frac{9.39^2}{9}+\frac{11.15^2}{9}\right)^2}{\frac{\left(\frac{9.39^2}{9}\right)^2}{8}+\frac{\left(\frac{11.15^2}{9}\right)^2}{8}}=10.96$

$(\bar{x}-\bar{y})\pm t_{\frac{\alpha}{2}}(\nu)\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}=(7.37-6.78)\pm t_{0.025}(11)\sqrt{[illegible]}$

$=0.59\pm2.201\times7.7$

$=0.59\pm16.95$

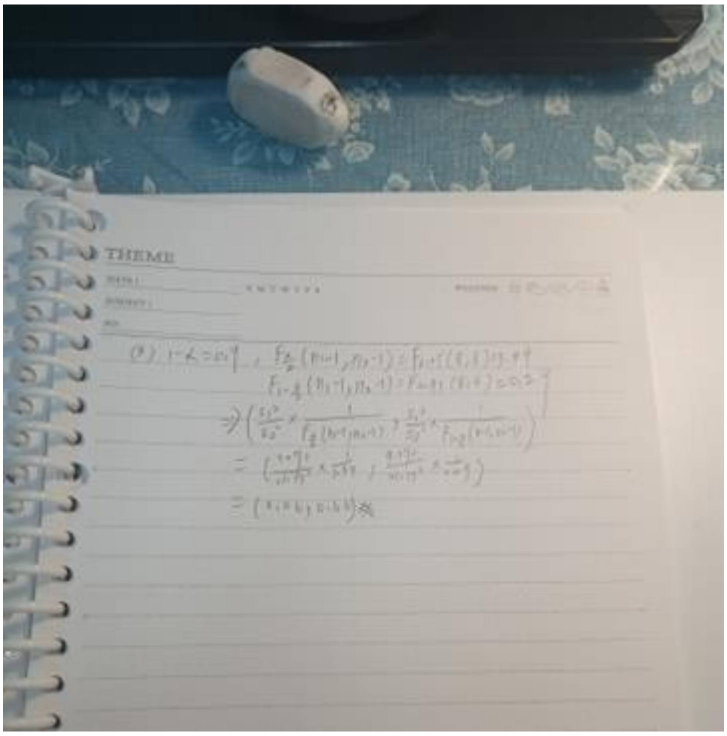
$\Rightarrow(-16.36, 17.54)$ #

(2) $1-\alpha=0.9$, $\chi^2_{\frac{\alpha}{2}}(n_1-1)=\chi^2_{0.05}(8)=15.51$

$\chi^2_{1-\frac{\alpha}{2}}(n_1-1)=\chi^2_{0.95}(8)=2.73$

∴ $\left(\sqrt{\frac{8\times9.39^2}{\chi^2_{0.05}(8)}},\sqrt{\frac{8\times9.39^2}{\chi^2_{0.95}(8)}}\right)=\left(\sqrt{\frac{705.39}{15.51}},\sqrt{\frac{705.39}{2.73}}\right)$

$=(6.66, 15.87)$ #



THEME

DATE: S M T W T F S WEATHER

SUBJECT:

NO:

(3) $1-\alpha=0.9$, $F_{\frac{\alpha}{2}}(n_1-1,n_2-1)=F_{0.05}(8,8)=3.44$

$F_{1-\frac{\alpha}{2}}(n_1-1,n_2-1)=F_{0.95}(8,8)=0.29$

$\Rightarrow\left(\frac{s_1^2}{s_2^2}\times\frac{1}{F_{\frac{\alpha}{2}}(n_1-1,n_2-1)},\frac{s_1^2}{s_2^2}\times\frac{1}{F_{1-\frac{\alpha}{2}}(n_1-1,n_2-1)}\right)$

$=\left(\frac{9.39^2}{11.15^2}\times\frac{1}{3.44},\frac{9.39^2}{11.15^2}\times\frac{1}{0.29}\right)$

$=(0.206, 2.45)$ #