9.(1) $\bar{x} = \frac{85}{5} = 14.33$ $n-1=5$

樣本標準差 $= \sqrt{\frac{15^2+15^2+19^2+11^2+17^2+14^2-6\times14.33^2}{5}}$

$= \sqrt{\frac{1284-1232.1}{5}} = \sqrt{10.38} = 3.22$ ※

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

$\chi^2_{0.05}(5) = 11.07$

$\chi^2_{1-0.05}(5) = \chi^2_{0.95}(5) = 1.15$

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

$= (2.17, 6.72)$ ※

2.

$n_1=9$ $\bar{x}=7.67$ $S_1=9.27$

$n_2=9$ $\bar{y}=6.78$ $S_2=21.15$

(1) $\sigma_1 \neq \sigma_2$

$V = \left(\frac{9.27^2}{9} + \frac{21.15^2}{9}\right)^2 = 10.96$

$\frac{\left[\frac{9.27^2}{9}\right]^2}{8} + \frac{\left[\frac{21.15^2}{9}\right]^2}{8}$

$\therefore \mu_1-\mu_2$ 之 95% 信賴區間

$(7.67-6.78) \pm t_{0.025(11)}\sqrt{\frac{9.27^2}{9}+\frac{21.15^2}{9}}$

$= 0.89 \pm 2.201 \times 7.70$

$= 0.89 \pm 16.95$

$= (-16.06, 17.84)$ ※

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

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

σ^2 之 90% 信賴區間

$\left(\sqrt{\frac{8\times9.27^2}{\chi^2_{0.05}(8)}}, \sqrt{\frac{8\times9.27^2}{\chi^2_{0.95}(8)}}\right) = (5.66, 15.87)$ ※

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

$F_{0.95}(8,8) = 0.29$

$\left[\frac{9.27^2}{21.15^2}\times\frac{1}{3.44}, \frac{9.27^2}{21.15^2}\times\frac{1}{0.29}\right]$

$\doteq (0.06, 0.66)$ ※