8

(1)

$$S=\sqrt{\frac{\sum(X_i-\overline{X})^2}{n-1}}=\sqrt{\frac{1284-6\times14.33^2}{6-1}}=\sqrt{10.38}=3.22\ \#$$

(2)

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

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

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

$$\left(\sqrt{\frac{(n-1)S^2}{\chi^2_{\frac{\alpha}{2}}(v)}},\ \sqrt{\frac{(n-1)S^2}{\chi^2_{1-\frac{\alpha}{2}}(v)}}\right)=\left(\sqrt{\frac{5\times10.38}{11.07}},\ \sqrt{\frac{5\times10.38}{1.15}}\right)=(2.17,\ 6.72)\ \#$$

20、

(2)

$1-\alpha=0.9$, $\frac{\alpha}{2}=0.05$, $n-1=8$

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

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

$$\left(\sqrt{\frac{8\times9.27^2}{15.51}},\ \sqrt{\frac{8\times9.27^2}{2.73}}\right)=\left(\sqrt{\frac{687.46}{15.51}},\ \sqrt{\frac{687.46}{2.73}}\right)=16.66,\ 15.87)\ \#$$

(1) $\sigma_1^2\neq\sigma_2^2$

$$v=\frac{\left(\frac{9.27^2}{9}+\frac{21.5^2}{9}\right)^2}{\frac{\left(\frac{9.27^2}{9}\right)^2}{8}+\frac{\left(\frac{21.5^2}{9}\right)^2}{8}}=10.96\approx11$$

$$(\bar{x}-\bar{y})\pm t_{\frac{\alpha}{2}}(v)\sqrt{\frac{S_1^2}{n_1}+\frac{S_2^2}{n_2}}=(7.67-6.78)\pm t_{0.025}(11)\sqrt{\frac{9.27^2}{9}+\frac{21.15^2}{9}}$$

$=0.89\pm2.201\times7.7$

$=0.89\pm16.95$

$\Rightarrow(-16.06,\ 17.84)\ \#$

(3)

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

$$F_{1-\frac{\alpha}{2}}(n_1-1,n_2-1)=F_{0.95}(8.8)=\frac{1}{F_{0.05}(8,8)}=0.29$$

$$\left(\frac{S_1^2}{S_2^2}\times\frac{1}{F_{\frac{\alpha}{2}}(n_1-1,n_2-1)},\ \frac{S_1^2}{S_2^2}\times\frac{1}{F_{1-\frac{\alpha}{2}}(n_1-1,n_2-1}\right)=\left(\frac{9.27^2}{21.15^2}\times\frac{1}{3.44},\ \frac{9.27^2}{21.15^2}\times\frac{1}{0.29}\right)$$

$=(0.06,\ 0.66)\ \#$