DATE

習20

$\sigma_1^2 \neq \sigma_2^2$, $\frac{\alpha}{2} = 0.025$

小樣本 $n=9$

$$v = \frac{\left[\frac{(9.27)^2}{9} + \frac{(21.15)^2}{9}\right]^2}{\frac{(9.55)^2}{8} + \frac{(49.7)^2}{8}} = \frac{(9.55+49.7)^2}{320.16} = 10.97 \fallingdotseq 11$$

| $x_i$ | 13 | 5 | 24 | -6 | 15 | 5 | -4 | 9 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| $x_i^2$ | 169 | 25 | 576 | 36 | 225 | 25 | 16 | 81 | 64 |

$\bar{x} = \frac{69}{9} = 7.67$, $S_1 = \frac{1217 - 9(7.67)^2}{8} = \sqrt{85.94} = 9.27$

| $y_i$ | 17 | 1 | -16 | 31 | 26 | -20 | 32 | -17 | 5 |
|---|---|---|---|---|---|---|---|---|---|
| $y_i^2$ | 361 | 1 | 256 | 961 | 676 | 400 | 1024 | 289 | 25 |

$\bar{y} = 6.78$, $S_2 = \frac{3993 - 9(6.78)^2}{8} = 21.15$

1) $(\bar{x} - \bar{y}) \pm t_{0.025}(11)\sqrt{9.55+49.7}$

$= 0.89 \pm 2.201(7.7)$

$= 0.89 \pm 16.95$

$= (16.06, 17.95)$ #

2) $\sigma\left(\sqrt{\frac{(n-1)S^2}{\chi^2_{\frac{\alpha}{2}}(v)}}, \sqrt{\frac{(n-1)S^2}{\chi^2_{1-\frac{\alpha}{2}}(v)}}\right)$

$\frac{\alpha}{2} = 0.05$

$v = n-1$

$= \left(\sqrt{\frac{8(9.27)^2}{\chi^2_{0.05}(8)}}, \sqrt{\frac{8(21.15)^2}{\chi^2_{0.95}(8)}}\right)$

$= (6.66, 15.87)$ #