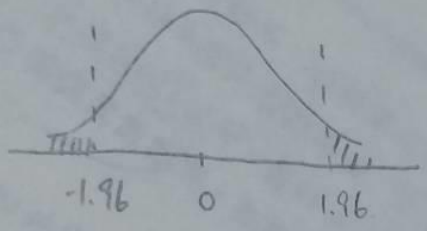
7-3

(1) $H_0: \mu = 30$, $H_1: \mu \neq 30$

(2) $\alpha = 0.05$

(3) $C = \{|z| > z_{0.025}\} = \{|z| > 1.96\}$

(4) $z = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}} = \frac{30.463 - 30}{\frac{7.344}{\sqrt{64}}} = 1.913$



不棄卻 H_0 ，沒有充分證據顯示業者宣稱有誤 #

7-4

P-值 $= 2P(z > 1.913)$

$\cong 2P(z > 1.91)$

$= 2 \times (1 - 0.9719)$

$= 2 \times 0.0281$

$= 0.0562 > \alpha$

不棄卻 H_0 #

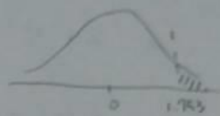
(7-5)

(1) $H_0: u \le 55$, $H_1: u > 55$

(2) $\alpha = 0.05$

(3) $C = \{T > t_{0.05}(15)\} = \{T > 1.753\}$

(4) $T = \dfrac{\bar{x} - u_0}{\frac{s}{\sqrt{n}}} = \dfrac{59.312 - 55}{\frac{13.189}{\sqrt{16}}} = 1.308$



不棄卻 H_0，今年並沒有偏胖於去年 #

P-值 $= P(T > 1.308)$

$\cong P(T > 1.31)$

P-值介於 0.1 ~ 0.25 之間

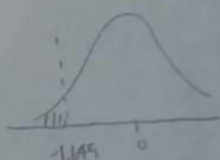
(7-6)

(1) $H_0: u_1 - u_2 \ge 0$, $H_1: u_1 - u_2 < 0$

(2) $\alpha = 0.05$

(3) $C = \{Z < -Z_{0.05}\} = \{Z < -1.645\}$

(4) $Z = \dfrac{(\bar{x} - \bar{y}) - d_0}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} = \dfrac{(6.98 - 7.2) - 0}{\sqrt{\frac{0.78^2}{200} + \frac{0.75^2}{180}}} = -2.801$



棄卻 H_0

男學生平均睡眠少於女學生 #

(7-7)

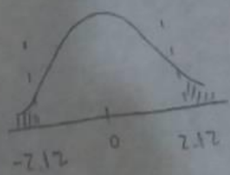
(1) $H_0: u_1 - u_2 = 0$, $H_1: u_1 - u_2 \ne 0$

(2) $\alpha = 0.05$

(3) $C = \{|T| > t_{\frac{\alpha}{2}}(n_1 + n_2 - 2)\} = \{|T| > t_{0.025}(16)\} = \{|T| > 2.12\}$

(4) $S_p = \sqrt{\dfrac{9 \times 0.653^2 + 7 \times 0.627^2}{10 + 8 - 2}} = 0.642$

$T = \dfrac{(7.728 - 7.546) - 0}{0.642\sqrt{\frac{1}{10} + \frac{1}{8}}} = 0.598$



不棄卻 H_0

無明顯差異 #

7-8

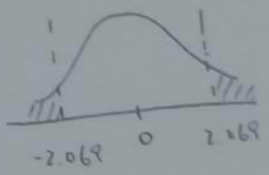
(1) $H_0: \mu_1 - \mu_2 = 0$, $H_1: \mu_1 - \mu_2 \neq 0$

(2) $\alpha = 0.05$

(3) $v = \dfrac{\left(\frac{4.82^2}{12} + \frac{8.54^2}{15}\right)^2}{\frac{\left(\frac{4.82^2}{12}\right)^2}{12-1} + \frac{\left(\frac{8.54^2}{15}\right)^2}{15-1}} = 22.773 \approx 23$

$C = \{|T| > t_{\frac{\alpha}{2}}(v)\} = \{|T| > t_{0.025}(23)\} = \{|T| > 2.069\}$

(4) $T = \dfrac{(78.25 - 77.6) - 0}{\sqrt{\frac{4.82^2}{12} + \frac{8.54^2}{15}}} = 2.167$



拒絕 H_0，2種教學方法對學生成績表現有顯著差異

7-9

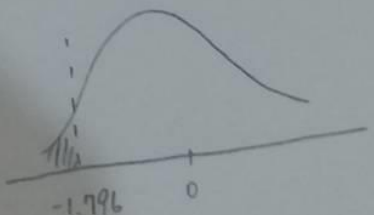
(1) $H_0: \mu_1 - \mu_2 \geq 0$, $H_1: \mu_1 - \mu_2 < 0$

(2) $\alpha = 0.05$

(3) $C = \{T < -t_\alpha(n-1)\} = \{T < -t_{0.05}(11)\} = \{T < -1.796\}$

(4) $\bar{d} = -3.5$, $Sd = 5.231$

$T = \dfrac{-3.5 - 0}{\frac{5.231}{\sqrt{12}}} = -2.318$



拒絕 H_0，接受進修後的員工可以有比較好的工作表現