7.6

(1) $H_0: M_1 - M_2 \geq 0$ , $H_1: M_1 - M_2 < 0$

(2) $\alpha = 0.05$

(3) 棄卻域 $C = \{ Z < -Z_\alpha \} = \{ Z < -1.645 \}$

(4) $Z = \dfrac{6.98 - 7.2}{\sqrt{\frac{0.98^2}{200} + \frac{0.75^2}{180}}} = 2.801$

∴ 男>女 睡眠時間 <性

7.7

(1) $H_0: M_1 - M_2 = 0$   $H_1: M_1 - M_2 \neq 0$

(2) $\alpha = 0.05$

(3) 棄卻域 $C = \{ |T| > t_{\frac{\alpha}{2}}(n_1 + n_2 - 2) \} = \{ |T| > t_{0.025}(16) \} = \{ |T| > 2.120 \}$

(4) $Sp = \sqrt{\dfrac{9 \times 0.653^2 + 7 \times 647^2}{10 + 8 - 2}} = 0.642$ , $T = \dfrac{7.728 - 7.546}{0.642 \sqrt{\frac{1}{10} + \frac{1}{8}}} = 0.598$

∴ 2種嬰兒奶粉對體重無明顯差異

7.8

(1) $H_0: M_1 - M_2 = 0$, $H_1: M_1 - M_2 \neq 0$

(2) $\alpha = 0.05$

(3) $V = \dfrac{\left( \frac{S_1^2}{n_1} + \frac{S_2^2}{n_2} \right)^2}{\frac{\left( \frac{S_1^2}{n_1} \right)^2}{n_1 - 1} + \frac{\left( \frac{S_2^2}{n_2} \right)^2}{n_2 - 1}} = \dfrac{\left( \frac{4.82^2}{12} + \frac{6.51^2}{15} \right)^2}{\frac{\left( \frac{4.82^2}{12} \right)^2}{12 - 1} + \frac{\left( \frac{6.51^2}{15} \right)^2}{15 - 1}} = 22.773 \doteq 23$

棄卻域 $C = \{ |T| > t_{0.025}(23) \} = \{ |T| > 2.069 \}$

(4) $T = \dfrac{78.25 - 72.6}{\sqrt{\frac{4.82^2}{12} + \frac{6.51^2}{15}}} = 2.167$    ∴ 有顯著差異

7.9

(1) $H_0: M_1 - M_2 \geq 0$ , $H_1: M_1 - M_2 < 0$

(2) $\alpha = 0.05$

(3) 棄卻域 $C = \{ \bar{T} < -t_{0.05}(11) \} = \{ \bar{T} < -1.796 \}$

(4) $T = \dfrac{\bar{T} - d_0}{\frac{S_d}{\sqrt{n}}} = \dfrac{-3.5 - 0}{\frac{5.231}{\sqrt{12}}} = -2.318$    ∴ 進修後有較好的工作表現