1.

某公司研發部針對某產品發展出一套新的作業方法，為了解其效率是否較佳，由製造部門隨機指派 10 名員工分為 A,B 兩組，A 組採新的作業方法，B 組仍採用原有的作業方法。

條件:兩母體都為常態的 random sample，且互相獨立

2.

(a)

Sample 1 : 9

Sample 2 : 7

(b)

Sample 1 : 2.28

Sample 2 : 1.789

(c)

x1 bar-x2 bar

(d)

(9-7-sqrt((1/6+1/6)*4.2)*1.7959 , 9-7+sqrt((1/6+1/6)*4.2)*1.7959)

(-0.125, 4.125)

3.

(a)

Let p1 = population proportion of men expecting to get a raise or promotion this year

p2= population proportion of women expecting to get a raise or promotion this year

H0: p1 – p2 ≤ 0

Ha: p1 – p2 > 0

(b)

p1 bar = 104/204 =0.52 , p2 bar = 74/200 = 0.37 , p hat = (104+74)/(200+200)=0.445

(c)

z=(0.52-0.37)/sqrt(0.445(0.555)(1/200+1/200)) = 3.02

p-value = 1.0000 – .9987 = .0013 Reject H0. There is a significant difference between the population proportions with a great proportion of men expecting to get a raise or a promotion this year.

4.

H0 : sigma^2 ≥ 50

H1 : sigma^2 <50

Reject H0 if $\chi < \chi^2_{0.95}(15) = 7.26$ or p-value < 0.05

$\chi = \frac{15*9.5^2}{50} = 27.075$ > 7.26 , p-value > 0.5

do not reject H0 at alpha = 0.05 level

表示無足夠證據顯示母體變異數 ≥ 50

5.

(a)

Difference = Price deluxe – Price standard

H0: $\mu_d = 10$

Ha: $\mu_d \neq 10$

T = (8.86-10)/(2.61/sqrt(7)) = -1.16

Using t table, area is between .10 and .20. Two-tail p-value is between .20 and .40. Exact p-value corresponding to t = −1.16 is .2901. Do not reject H0; we cannot reject the hypothesis that a $10 price differential exists.

(b)

(8.86-2.447*2.61/sqrt(7) , 8.86+2.447*2.61/sqrt(7))

(6.45 , 11.27)

6.

(a)

Consider the talk time use as population 1 and Internet use as population 2.

H0 : $\sigma_1^2 \leq \sigma_2^2$

H1 : $\sigma_1^2 > \sigma_2^2$

(b)

s1 = 7.36 , s2 = 4.77

(c)

F = 7.36^2/4.77^2 = 2.38

The p–value is the upper–tail area at F = 2.38. From the F table, the p–value is between .05 and .10. Exact p–value corresponding to F = 2.38 is .09. p–value > .05; do not reject H0. There is not a statistically significant difference in the population variance in battery life for talk time and the population variance in battery life for the Internet use.