

3.

Correlation coefficient, $r = -0.94$

$$\alpha = 0.05$$

$$\begin{aligned} \text{Test statistic} &= \frac{r}{\sqrt{\frac{1-r^2}{n-2}}} \\ &= \frac{-0.94}{\sqrt{\frac{1-(-0.94)^2}{18-2}}} \\ &= \frac{-0.94}{0.0853} \\ &= -10.935 \end{aligned}$$

$$p\text{-value} = 0$$

Reject H_0 . There is sufficient evidence to show that there is correlation.

4.

$$H_0: \mu_1 = \mu_2$$

$$H_A: \mu_1 < \mu_2$$

$$\bar{X}_1 = 37.9, S_1 = 8.571, n_1 = 20$$

$$\bar{X}_2 = 50.55, S_2 = 9.971, n_2 = 20$$

$$\begin{aligned} t &= \frac{(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}, s_p^2 = \frac{df_1 \cdot S_1^2 + df_2 \cdot S_2^2}{df_1 + df_2} \\ &= \frac{(37.9 - 50.55)}{s_p} \\ &= \frac{-12.65}{1.84572} = -6.854 \end{aligned}$$

$$\begin{aligned} s_{\bar{x}} &= \frac{s_{\text{pooled}}}{\sqrt{n}} = \frac{7.8306}{\sqrt{16}} \\ &= 1.84572 \end{aligned}$$

$$P = 0$$

$$1. H_0: \mu_1 = \mu_2$$

$$H_A: \mu_1 \neq \mu_2$$

$$\alpha = 0.05$$

$$\bar{x}_1 = 24.4$$

$$\bar{x}_2 = 19.286$$

$$s_1 = 2.591$$

$$s_2 = 3.094$$

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$= \frac{24.4 - 19.286}{\sqrt{\frac{2.591^2}{10} + \frac{3.094^2}{7}}}$$

$$= 3.5815$$

$$P\text{-value} = 0.004$$

Reject H_0 since $p\text{-value} < \alpha$. There is sufficient evidence to show that body composition differs among prepubescent males and females.

2.

95%

$$t_c =$$

$$CI = (\bar{x}_1 - \bar{x}_2) \pm t_c \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$

$$\pm 5.114 \pm 3.043$$

$$= (2.071, 8.157)$$

Reject H_0 . There is enough evidence to show that $VO_2 \text{ max}$ was higher than the first time