

3.

(2)

$$W = \{15S^2 \geq \chi_{0.05}^2(15)\}$$

$$P = 1 - P(S^2 \geq \frac{6.664}{6} = 1.111) = 1 - P(\frac{15}{4}S^2 \geq 6.249) = 0.0247$$

(3)

$$P_1 = 2(1 - \Phi(1.84)) = 0.0308$$

$$P_2 = P(\chi^2(15) \geq \chi_0^2) = P\{\chi^2(15) \geq 21.6\} = 0.1187$$

8.

$$\frac{(n-1)S^2}{\sigma^2} \sim \chi^2(n-1), S^2 = 25.149$$

$$W = \{X^2 \leq \chi_{0.95}^2(4)\}$$

$$\chi_0^2 = \frac{14 \times 25.149}{64} = 5.501 < 6.571$$

$$P_- = P\{X^2(4) \leq 5.501\} = 0.021.$$

9.

$$H_0: \mu_0 = 550, \mu_1 \neq 550$$

$$T = \frac{\bar{X} - \mu_0}{S/\sqrt{n}}, W = \{|T| \geq t_{0.025}(8)\}$$

$$P_- = P\{|t(8)| \geq t_0\} = 0.134 > 0.05$$

$$(2) \sigma_0 \leq 5.5, \sigma_1 > 5.5$$

$$X^2 = \frac{(n-1)S^2}{\sigma_0^2}, W = \{X^2 \geq \chi_{0.05}^2(8)\}$$

$$P_- = P\{X^2(8) \geq \chi_0^2\} = 0.232.$$

$$13. (1) H_0: \sigma_1^2 = \sigma_2^2 \quad H_1: \sigma_1^2 \neq \sigma_2^2$$

$$X \sim N(\mu_1, \sigma_1^2) \quad X_2 \sim N(\mu_2, \sigma_2^2)$$

$$F = \frac{S_1^2}{S_2^2}, \quad W = \{F \geq F_{0.025}(7.8)\}, \quad f_0 = 0.919$$

$$\therefore F_{0.025}(7.8) > f_0 > F_{0.975}(7.8)$$

$$(2) H_0: \mu_1 \geq \mu_2 \quad H_1: \mu_1 < \mu_2$$

$$S_w^2 = \frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1 + n_2 - 2} = 1.642, \quad t_0 = \frac{\bar{x} - \bar{y}}{S_w \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = -0.993$$

$$\therefore \text{拒绝域 } \{T \leq -t_{0.05}(15)\}$$

\therefore 不拒绝假设。

15. 新题.

对照

$$(1) X \sim N(\mu_1, \sigma_1^2) \quad Y \sim N(\mu_2, \sigma_2^2)$$

$$H_0: \sigma_1^2 = \sigma_2^2, \quad H_1: \sigma_1^2 \neq \sigma_2^2, \quad F = \frac{S_1^2}{S_2^2}$$

$$W = \{F \geq F_{0.025}(11.9)\}$$

$$\bar{X} = 126.75, \quad \bar{Y} = 164.3, \quad S_1^2 = 140.75, \quad S_2^2 = 62.4$$

$$f_0 = 2.256, \quad t_{0.975}(11.9) < f_0 < t_{0.025}(11.9) \therefore \text{不拒绝假设}$$

$$(2) H_0: \mu_1 = \mu_2, \quad H_1: \mu_1 \neq \mu_2$$

$$T = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}, \quad W = \{|T| > t_{0.025}(k)\}, \quad k = \frac{(A+B)^2}{\frac{A^2}{n_1-1} + \frac{B^2}{n_2-1}} \approx 19$$

$$\therefore t_{0.025}(19) = 2.0930 < |t_0| = 8.835 \therefore \text{拒绝假设}$$

17. H_0 : 均匀 H_1 : 不均匀

$$p_i = \frac{1}{8}$$

$$W = \{ \chi^2 \geq \chi_{0.05}^2(7) \} \quad \chi_0^2 = \sum \frac{n_{ij}^2}{np_{ij}} - n = 6.37 < \chi_{0.05}^2(7)$$

\therefore 不拒绝假设

18. $H_0: X \sim P(\lambda)$ H_1 : 不满足 $P(\lambda)$

解:

$$\chi_0^2 = \sum \frac{n_{ij}^2}{np_{ij}} - n = 8.13$$

$$W = \{ \chi^2 \geq \chi_{0.05}^2(5) = 11.1 \}$$

$$\therefore \chi_0^2 = 8.13 < 11.1$$

\therefore 不拒绝假设

19. $H_0: X \sim \exp(\lambda)$, $E(\exp W) = 10$

$$\chi_0^2 = \sum \frac{n_{ij}^2}{np_{ij}} - n = 8.721$$

$$W = \{ \chi^2 \geq \chi_{0.05}^2(3) = 7.815 \}$$

\therefore 拒绝假设

20. $H_0: X \sim N(\mu, \sigma^2)$, $\hat{\mu} = 169.9$, $\sigma^2 = 9.6^2$

$$\chi_0^2 = \sum \frac{n_{ij}^2}{np_{ij}} - n = 4.96788 < 0.8905 = \chi_{0.05}^2(4)$$

$$W = \{ \chi^2 \geq \chi_{0.05}^2(4) = 9.488 \}$$

\therefore 不拒绝假设