

Answers to Selected Exercises

9. Hypothesis Testing

2. Tests in the Normal Model
 3. Tests in the Bernoulli Model
 4. Tests in the Two Sample Normal Model
 5. Chi-Square Tests
-

2. Tests in the Normal Model

- 2.43.
- a. Test statistic 3.33, critical values ± 1.645 . Reject H_0
 - b. $P = 0.0010$
 - c. The power of the test at 10.05 is approximately 0.0509.
 - d. Sample size 223
- 2.44.
- a. Test statistic -3.464 , critical value -1.665 . Reject H_0
 - b. $P < 0.0001$ so reject H_0
- 2.45.
- a. Test statistic 2.828, critical value 1.2988. Reject H_0
 - b. $P = 0.0071$ so reject H_0
- 2.46.
- a. Test statistic 2.0, critical value 2.363. Fail to reject H_0
 - b. $P < 0.0001$ so reject H_0
- 2.47. Test statistic -1 , critical value -2.328 . Fail to reject H_0
- 2.48. Test statistic 15.49, critical value 2.6270. Reject H_0
- 2.49. Test statistic -1.269 , critical value -1.7017 . Fail to reject H_0
- 2.50. Test statistic -3.730 , critical value ± 1.6748 . Reject H_0
- 2.51.
- a. Test statistic -1.563 , critical values ± 1.672 . Fail to reject H_0
 - b. Test statistic 4.556, critical value 1.2988. Reject H_0
 - c. Test statistic -1.028 , critical value -1.2988 . Fail to reject H_0

3. Tests in the Bernoulli Model

- 3.9. Test statistic 1.743, critical value 1.282. Reject H_0
- 3.10. Test statistic 1.743, critical values ± 1.961 . Reject H_0 ; The coin is almost certainly unfair.
- 3.11. Test statistic -1.333 , critical value -1.645 . Fail to reject H_0 .
- 3.12. Test statistic 0.707, critical value 1.282. Fail to reject H_0 .
- 3.13.

- a. Test statistic 0.162, critical values ± 1.645 Fail to reject H_0 .
- b. Test statistic -4.117 , critical value -1.282 Reject H_0 .
- c. Test statistic 8.266, critical value 1.282. Reject H_0 .

3.19. Test statistic 3.286, critical value 1.282. Reject H_0 .

3.20.

- a. Test statistic 3.394, critical values ± 1.645 Reject H_0 .
- b. Test statistic -1.980 , critical value -1.282 Reject H_0 .
- c. Test statistic -0.566 , critical value -1.282 . Fail to reject H_0 .

4. Tests in the Two-Sample Normal Model

4.15.

- a. Test statistic 0.4, critical values 0.585, 1.667. Reject H_0 .
- b. Test statistic 1.0, critical values ± 1.6625 . Fail to reject H_0 .
- c. Probably not

4.16. Test statistic 2.8, critical value 1.3184. Reject H_0 .

4.17.

- a. Test statistic 1.1, critical values 0.6227, 1.6072. Fail to reject H_0 .
- b. Test statistic -11.4 , critical value -1.6602 . Reject H_0 .

4.18.

- a. Test statistic 0.56, critical values 0.7175, 1.3942. Reject H_0 .
- b. Test statistic -4.97 , critical values ± 1.645 . Reject H_0 .

6. Chi-Square Tests

6.15. 1 degree of freedom, $V = 1$, $P = 0.3173$.

6.16.

- a. 3 degree of freedom, $V = 11.78$, $P = 0.008$.
- b. 2 degree of freedom, $V = 2.301$, $P = 0.316$.

6.17.

- a. 5 degree of freedom, $V = 5.383$, $P = 0.371$.
- b. 5 degree of freedom, $V = 18.45$, $P = 0.002$.

6.18.

- a. 10 degree of freedom, $V = 6.2$, $P = 0.798$.
- b. 5 degree of freedom, $V = 7.103$, $P = 0.213$.

6.19. 1 degree of freedom, $V = 4.332$, $P = 0.037$.

6.20. We use the following partition of \mathbb{N} : $\{\{0, 1, 2\}, \{3\}, \{4\}, \dots, \{8\}, \{9, 10, \dots\}\}$.

- a. 7 degrees of freedom, $V = 11.321$, $P = 0.125$.
- b. 6 degrees of freedom, $V = 8.141$, $P = 0.228$.

6.21. 3 degrees of freedom, $V = 70.111$, $P \approx 0$.

6.22. Using the following partition of \mathbb{R} :

$\{-\infty, 750), [750, 775), [775, 800), [800, 825), [825, 850), [850, 875), [875, 900), [900, 925), [925, 950), [950, 975), [975, \infty)\}$

. we have 8 degrees of freedom, $V = 11.443$, $P = 0.178$.

[Virtual Laboratories](#) > [9. Hypothesis Testing](#) > [Answers to Selected Exercises](#)