

10.15: Chapter Solution (Practice + Homework)

1.

two proportions

3.

matched or paired samples

5.

single mean

7.

independent group means, population standard deviations and/or variances unknown

9.

two proportions

11.

independent group means, population standard deviations and/or variances unknown

13.

independent group means, population standard deviations and/or variances unknown

15.

two proportions

17.

The random variable is the difference between the mean amounts of sugar in the two soft drinks.

19.

means

21.

two-tailed

23.

the difference between the mean life spans of whites and nonwhites

25.

This is a comparison of two population means with unknown population standard deviations.

27.

Check student's solution.

28.

1. 31.

$P'_{OS1} - P'_{OS2}$ = difference in the proportions of phones that had system failures within the first eight hours of operation with OS_1 and OS_2 .

proportions

36.

right-tailed

38.

The random variable is the difference in proportions (percents) of the populations that are of two or more races in Nevada and North Dakota.

40.

Our sample sizes are much greater than five each, so we use the normal for two proportions distribution for this hypothesis test.

42.

1. 44.

The difference in mean speeds of the fastball pitches of the two pitchers

-2.46

47.

At the 1% significance level, we can reject the null hypothesis. There is sufficient data to conclude that the mean speed of Rodriguez's fastball is faster than Wesley's.

49.

Subscripts: 1 = Food, 2 = No Food

$$H_0 : \mu_1 \leq \mu_2$$

$$H_a : \mu_1 > \mu_2$$

51.

Subscripts: 1 = Gamma, 2 = Zeta

$$H_0 : \mu_1 = \mu_2$$

$$H_a : \mu_1 \neq \mu_2$$

53.

There is sufficient evidence so we reject the null hypothesis. The data support that the melting point for Alloy Zeta is different from the melting point of Alloy Gamma.

54.

the mean difference of the system failures

56.

With a p -value 0.0067, we reject the null hypothesis. There is enough evidence to support that the software patch is effective in reducing the number of system failures.

60.

$$H_0 : \mu_d \geq 0$$

$$H_a : \mu_d < 0$$

63.

We decline to reject the null hypothesis. There is not sufficient evidence to support that the medication is effective.

65.

Subscripts: 1: two-year colleges; 2: four-year colleges

1. 67.

Subscripts: 1: mechanical engineering; 2: electrical engineering

1. 69.

1. 71.

1. 74.

c

Test: two independent sample means, population standard deviations unknown. Random variable:

$$\bar{X}_1 - \bar{X}_2$$

Distribution: $H_0 : \mu_1 = \mu_2$ $H_a : \mu_1 < \mu_2$. The mean age of entering prostitution in Canada is lower than the mean age in the United States.

Graph: left-tailed p -value : 0.0151

Decision: Cannot reject H_0 .

Conclusion: At the 1% level of significance, from the sample data, there is not sufficient evidence to conclude that the mean age of entering prostitution in Canada is lower than the mean age in the United States.

78.

d

80.

1. 82.

Subscripts: 1 = Cabrillo College, 2 = Lake Tahoe College

1. 84.

a

Test: two independent sample proportions.

Random variable: $p'_1 - p'_2$

Distribution: $H_0 : p_1 = p_2$ $H_a : p_1 \neq p_2$. The proportion of eReader users is different for the 16- to 29-year-old users from that of the 30 and older users.

Graph: two-tailed

87.

Test: two independent sample proportions

Random variable: $p'_1 - p'_2$

Distribution: $H_0 : p_1 = p_2$ $H_a : p_1 > p_2$. A higher proportion of tablet owners are aged 16 to 29 years old than are 30 years old and older.

Graph: right-tailed

Do not reject the H_0 .

Conclusion: At the 1% level of significance, from the sample data, there is not sufficient evidence to conclude that a higher proportion of tablet owners are aged 16 to 29 years old than are 30 years old and older.

89.

Subscripts: 1: men; 2: women

1. 91.

1. 92.

1. 94.

Subscripts: 1 = boys, 2 = girls

1. 96.

Subscripts: 1 = non-hybrid sedans, 2 = hybrid sedans

1. 98.

1. 99.

p -value = 0.1494

103.

Test: two matched pairs or paired samples (t -test)

Random variable: \bar{X}_d

Distribution: t_{12}

$H_0 : \mu_d = 0$ $H_a : \mu_d > 0$

The mean of the differences of new female breast cancer cases in the south between 2013 and 2012 is greater than zero. The estimate for new female breast cancer cases in the south is higher in 2013 than in 2012.

Graph: right-tailed

p -value: 0.0004

Decision: Reject H_0

Conclusion: At the 5% level of significance, from the sample data, there is sufficient evidence to conclude that there was a higher estimate of new female breast cancer cases in 2013 than in 2012.

105.

Test: matched or paired samples (t -test)

Difference

data:

$\{-0.9, -3.7, -3.2, -0.5, 0.6, -1.9, -0.5, 0.2, 0.6, 0.4, 1.7, -2.4, 1.8\}$

Random Variable: \bar{X}_d

Distribution: $H_0 : \mu_d = 0$ $H_a : \mu_d < 0$

The mean of the differences of the rate of underemployment in the northeastern states between 2012 and 2011 is less than zero. The underemployment rate went down from 2011 to 2012.

Graph: left-tailed.

Decision: Cannot reject H_0 .

Conclusion: At the 5% level of significance, from the sample data, there is not sufficient evidence to conclude that there was a decrease in the underemployment rates of the northeastern states from 2011 to 2012.

107.

e

109.

d

111.

f

113.

e

115.

f

117.

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