Practice 9   STA2023

Two Means Independent Samples

Broward College

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Test the indicated claim about the means of two populations. Assume that the two samples are independent simple random samples selected from normally distributed populations. Do not assume that the population standard deviations are equal. Use the traditional method or P-value method as indicated.

1) Two types of flares are tested and their burning times (in minutes) are recorded. The summary statistics are given below.

1) _____

Brand X	Brand Y
n = 35	n = 40
$\bar{x}$ = 19.4 min	$\bar{x}$ = 15.1 min
s = 1.4 min	s = 0.8 min

Use a 0.05 significance level to test the claim that the two samples are from populations with the same mean. Use the traditional method of hypothesis testing.

2) A researcher was interested in comparing the amount of time (in hours) spent watching television by women and by men. Independent simple random samples of 14 women and 17 men were selected, and each person was asked how many hours he or she had watched television during the previous week. The summary statistics are as follows.

2) _____

Women	Men
$\bar{x}_1$ = 12.1 hr	$\bar{x}_2$ = 14.2 hr
s_1 = 3.9 hr	s_2 = 5.2 hr
n_1 = 14	n_2 = 17

Use a 0.05 significance level to test the claim that the mean amount of time spent watching television by women is smaller than the mean amount of time spent watching television by men. Use the traditional method of hypothesis testing.

3) A researcher wishes to determine whether people with high blood pressure can reduce their blood pressure, measured in mm Hg, by following a particular diet. Use a significance level of 0.01 to test the claim that the treatment group is from a population with a smaller mean than the control group. Use the traditional method of hypothesis testing.

3) _____

Treatment Group	Control Group
n_1 = 101	n_2 = 105
$\bar{x}_1$ = 120.5	$\bar{x}_2$ = 149.3
s_1 = 17.4	s_2 = 30.2

4) A researcher was interested in comparing the salaries of female and male employees at a   4) _____
particular company. Independent simple random samples of 8 female employees and 15
male employees yielded the following weekly salaries (in dollars).

Female	Male	
495	722	518
760	562	904
556	880	1150
904	520	805
520	500	480
1005	1250	970
743	750	605
660	1640	

Use a 0.05 significance level to test the claim that the mean salary of female employees is
less than the mean salary of male employees. Use the traditional method of hypothesis
testing.
(Note: $\bar{x}_1$ = \$705.375, $\bar{x}_2$ = \$817.067, s_1 = \$183.855, s_2 = \$330.146.)

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Construct the indicated confidence interval for the difference between the two population means. Assume that the two
samples are independent simple random samples selected from normally distributed populations. Do not assume that
the population standard deviations are equal.

5) Two types of flares are tested and their burning times are recorded. The summary statistics are   5) _____
given below.

Brand X	Brand Y
n = 35	n = 40
$\bar{x}$ = 19.4 min	$\bar{x}$ = 15.1 min
s = 1.4 min	s = 0.8 min

Construct a 95% confidence interval for the differences between the mean burning time of the
brand X flare and the mean burning time of the brand Y flare.

A) 3.5 min < $\mu_X - \mu_Y$ < 5.1 min   B) 3.8 min < $\mu_X - \mu_Y$ < 4.8 min

C) 3.6 min < $\mu_X - \mu_Y$ < 5.0 min   D) 3.2 min < $\mu_X - \mu_Y$ < 5.4 min

6) Independent samples from two different populations yield the following data. $\bar{x}_1$ = 677, $\bar{x}_2$ = 211,   6) _____
s_1 = 30, s_2 = 30. The sample size is 245 for both samples. Find the 80% confidence interval for
$\mu_1 - \mu_2$.

A) 462 < $\mu_1 - \mu_2$ < 470   B) 466 < $\mu_1 - \mu_2$ < 466

C) 463 < $\mu_1 - \mu_2$ < 469   D) 460 < $\mu_1 - \mu_2$ < 472

7) A researcher was interested in comparing the amount of time spent watching television by women and by men. Independent simple random samples of 14 women and 17 men were selected, and each person was asked how many hours he or she had watched television during the previous week. The summary statistics are as follows.

Women	Men
$\bar{x}_1 = 12.8$ hrs	$\bar{x}_2 = 14.0$ hrs
$s_1 = 3.9$ hrs	$s_2 = 5.2$ hrs
$n_1 = 14$	$n_2 = 17$

Construct a 99% confidence interval for $\mu_1 - \mu_2$, the difference between the mean amount of time spent watching television for women and the mean amount of time spent watching television for men.

A) -5.71 hrs $< \mu_1 - \mu_2 <$ 3.31 hrs
B) -5.84 hrs $< \mu_1 - \mu_2 <$ 3.44 hrs
C) -5.85 hrs $< \mu_1 - \mu_2 <$ 3.45 hrs
D) -5.72 hrs $< \mu_1 - \mu_2 <$ 3.32 hrs

8) A researcher was interested in comparing the resting pulse rates of people who exercise regularly and the pulse rates of people who do not exercise regularly. She obtained independent simple random samples of 16 people who do not exercise regularly and 12 people who do exercise regularly. The resting pulse rates (in beats per minute) were recorded and the summary statistics are as follows.

Do not exercise regularly	Exercise regularly
$\bar{x}_1 = 72.3$ beats/min	$\bar{x}_2 = 68.2$ beats/min
$s_1 = 10.9$ beats/min	$s_2 = 8.2$ beats/min
$n_1 = 16$	$n_2 = 12$

Construct a 95% confidence interval for $\mu_1 - \mu_2$, the difference between the mean pulse rate of people who do not exercise regularly and the mean pulse rate of people who exercise regularly.

A) -3.32 beats/min $< \mu_1 - \mu_2 <$ 11.52 beats/min
B) -3.63 beats/min $< \mu_1 - \mu_2 <$ 11.83 beats/min
C) -3.65 beats/min $< \mu_1 - \mu_2 <$ 11.85 beats/min
D) -3.34 beats/min $< \mu_1 - \mu_2 <$ 11.54 beats/min

9) A researcher was interested in comparing the heights of women in two different countries. Independent simple random samples of 9 women from country A and 9 women from country B yielded the following heights (in inches).

Country A	Country B
64.1	65.3
66.4	60.2
61.7	61.7
62.0	65.8
67.3	61.0
64.9	64.6
64.7	60.0
68.0	65.4
63.6	59.0

Construct a 90% confidence interval for $\mu_1 - \mu_2$, the difference between the mean height of women in country A and the mean height of women in country B.
(Note: $\bar{x}_1 = 64.744$ in., $\bar{x}_2 = 62.556$ in., $s_1 = 2.192$ in., $s_2 = 2.697$ in.)

A) 0.17 in. $< \mu_1 - \mu_2 <$ 4.21 in.
B) 0.14 in. $< \mu_1 - \mu_2 <$ 4.24 in.
C) 0.16 in. $< \mu_1 - \mu_2 <$ 4.22 in.
D) 0.15 in. $< \mu_1 - \mu_2 <$ 4.23 in.