Chapter 8 Review

Name TEACHER

Perform hypothesis tests using p values or critical values. Show any work. Fill in the required information.

1) A weight-lifting coach claims that weight-lifters can increase their strength by taking a certain supplement. To test the theory, the coach randomly selects 9 athletes and gives them a strength test using a bench press. The results are listed below. Thirty days later, after regular training using the supplement, they are tested again. The new results are listed below. Test the claim that the supplement is effective in increasing the athletes' strength. Use $\alpha = 0.05$. Assume that the distribution is normally distributed.

Athlete	1	2	3	4	5	6	7	8	9
Before	215	240	188	212	275	260	225	200	185
After	225	245	188	210	282	275	230	195	190

Ho: $\mu_d \leq 0$ Right - tailed test

Ha: $\mu_d > 0$ CLAIM test statistic: $t = 2.17$

p-value: _____ or critical value: 1.86

Circle one: reject Ho fail to reject Ho

Circle one: not enough evidence to reject claim

enough evidence to reject claim

not enough evidence to support claim

enough evidence to support claim

2) A researcher wishes to determine whether people with high blood pressure can lower their blood pressure by following a certain diet. A treatment group and a control group are selected. The sample statistics are given below. Would you support the claim that this diet plan helps lower blood pressure? Use 0.01 as the level of significance.

Treatment Group	Control Group
$n_1 = 100$	$n_2 = 100$
$\bar{x}_1 = 178$	$\bar{x}_2 = 193$
$s_1 = 35$	$s_2 = 37$

Ho: $\mu_1 = \mu_2$ Left - tailed test

Ha: $\mu_1 < \mu_2$ Claim test statistic: -2.95

p-value: _____ or critical value: -2.33

Circle one: (reject Ho) fail to reject Ho

Circle one: not enough evidence to reject claim

enough evidence to reject claim

not enough evidence to support claim

(enough evidence to support claim)

3) A random sample of 100 students at a high school was asked whether they would ask their father or mother for help with a homework assignment in science. A second sample of 100 different students was asked the same question for an assignment in history. If 43 students in the first sample and 47 students in the second sample replied that they turned to their mother rather than their father for help, test the claim that the population proportions are the same and the difference between the proportions is due to chance. Use $\alpha = 0.02$.

Ho: $p_1 = p_2$ claim two - tailed test $n_1 100$ $x = 43$ $n_2 100$ $x_2 = 47$

Ha: $p_1 \neq p_2$ test statistic: $z = -.569$

p-value: _____ or critical value: $z_0 = -2.33$

Circle one: reject Ho (fail to reject Ho)

Circle one: (not enough evidence to reject claim)

enough evidence to reject claim

not enough evidence to support claim

enough evidence to support claim

4) In a study of effectiveness of physical exercise on weight loss, 20 people were randomly selected to participate in a program for 30 days. Test the claim that exercise had no bearing on weight loss. Use $\alpha = 0.02$. Assume that the distribution is normally distributed.

Weight before Program (in pounds)	178	210	156	188	193	225	190	165	168	200
Weight after program (in pounds)	182	205	156	190	183	220	195	155	165	200

Weight before Program (in pounds) Con't	186	172	166	184	225	145	208	214	148	174
Weight after program (in pounds) Con't	180	173	165	186	240	138	203	203	142	174

Ho: $\mu_d = 0$ Claim Two - tailed test

Ha: $\mu_d \neq 0$ test statistic: $z = 1.45$

p-value: _____ or critical value: $z = \pm 2.539$

Circle one: reject Ho fail to reject Ho

Circle one: not enough evidence to reject claim

enough evidence to reject claim

not enough evidence to support claim

enough evidence to support claim

5) A medical researcher suspects that the pulse rate of smokers is higher than the pulse rate of non-smokers. Use the sample statistics below to test the researcher's suspicion. Use $\alpha = 0.05$.

Smokers	Nonsmokers
$n_1 = 100$	$n_2 = 100$
$\bar{x}1 = 88$	$\bar{x}2 = 85$
$s_1 = 4.8$	$s_2 = 5.3$

$z_0 = 1.64$

$z =$

Ho: $\mu_1 \leq \mu_2$ Right - tailed test

Ha: $\mu_1 > \mu_2$ Claim test statistic: 4.20

p-value: _____ or critical value: 1.64

Circle one: (reject Ho) fail to reject Ho

Circle one: not enough evidence to reject claim

enough evidence to reject claim

not enough evidence to support claim

(enough evidence to support claim)

6) The students in algebra one class claim that they get more hours of homework than the students in algebra 2. Two samples are randomly selected from normal populations and the statistics are shown below. Assume the population variances are not equal. Test the claim using $\alpha = 0.01$.

Right

$n_1 = 18$	$n_2 = 13$
$\bar{x}1 = 590$	$\bar{x}2 = 575$
$s_1 = 40$	$s_2 = 25$

Ho: $\mu_1 \leq \mu_2$ Right - tailed test

Ha: $\mu_1 > \mu_2$ claim test statistic: $t = 1.28$

p-value: _____ or critical value: $t_0 2.68$

Circle one: reject Ho (fail to reject Ho)

Circle one: not enough evidence to reject claim

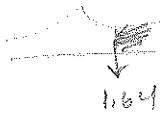
enough evidence to reject claim

(not enough evidence to support claim)

enough evidence to support claim

7) To test the effectiveness of a new drug designed to relieve pain, 200 patients were randomly selected and divided into two equal groups. One group of 100 patients was given a pill containing the drug while the other group of 100 was given a placebo. What can we conclude about the effectiveness of the drug if 62 of those actually taking the drug felt a beneficial effect while 41 of the patients taking the placebo felt a beneficial effect? We' ll test the claim that the proportion of patients getting the new drug who feel better is higher than the proportion in the placebo group. Use $\alpha = 0.05$.

100 62 100 41



Ho: $p_1 \leq p_2$ Right - tailed test

Ha: $p_1 > p_2$ Claim test statistic: 2.97

p-value: _____ or critical value: to 1.64

Circle one: reject Ho fail to reject Ho

Circle one: not enough evidence to reject claim

enough evidence to reject claim

not enough evidence to support claim

enough evidence to support claim

8) Ms. Rowe claims that there is no difference between the amount of cash male and female teachers carry daily. Two samples are randomly selected from normal populations. The sample statistics are given below. Assume that the population variances are equal. Use $\alpha = 0.05$ to test her claim.

males	females
$n_1 = 14$	$n_2 = 12$
$\bar{x}_1 = 21$	$\bar{x}_2 = 22$
$s_1 = 2.5$	$s_2 = 2.8$

Ho: $\mu_1 = \mu_2$ Claim two - tailed test

Ha: $\mu_1 \neq \mu_2$ test statistic: $t = \pm .95$

p-value: _____ or critical value: ± 2.20

Circle one: reject Ho fail to reject Ho

Circle one: not enough evidence to reject claim

enough evidence to reject claim

not enough evidence to support claim

enough evidence to support claim