College Prep Statistics Name _____
REVIEW: Chapter 9

1. Carpal tunnel syndrome is a common wrist complaint resulting from a compressed nerve, and it is often caused by repetitive wrist movements. In a randomized controlled trial, among 73 patients treated with surgery and evaluated on year later, 67 were found to have successful treatments. Among 83 patients treated with splints and evaluated on year later, 60 were found to have successful treatments (based on data from "Splinting vs Surgery in the Treatment of Carpal Tunnel Syndrome," by Gerritsen, et al., *Journal of the American Medical Association*, Vol. 288, No. 10). In a journal article about the trial, authors claimed that "treatment with open carpal tunnel release surgery resulted in better outcomes than treatment with wrist splinting for patients with CTS (carpal tunnel syndrome)." Use a 0.01 significance level to test that claim.

a) State the null hypothesis and the alternative hypothesis.

b) Calculate the pooled estimate, $\overline{p}$.

c) Determine the significance level.

d) Calculate the test statistic.

e) Determine the *P* – value.

f) What is the conclusion?

2. Researchers conducted a study to assess the effects that occur when children are exposed to cocaine before birth. Children were tested at age 4 for object assembly skill, which was described as "a task requiring visual-spatial skills related to mathematical competence." The 190 children born to cocaine users had a mean of 7.3 and a standard deviation of 3.0. The 186 children not exposed to cocaine had a mean score of 8.2 with a standard deviation of 3.0. (The data are based on "Cognitive Outcomes of Preschool Children with Prenatal Cocaine Exposure," by singer, et al., J*ournal of the American medical Association*, Vol. 291, No. 20) Use a 0.05 significance level to test the claim that prenatal cocaine exposure is associated with lower scores of four-year-old children on the test of object assembly.

a) State the null hypothesis and the alternative hypothesis.

b) Determine the significance level.

c) Calculate the test statistic.

d) Determine the *P* – value.

e) What is the conclusion?

3. In 1908, “Student” (William Gosset) published the article “The Probable Error of a Mean” (*Biometrika*, Vol. 6, No. 1). He included the data listed below for two different types of straw seed (regular and kiln dried) that were used on adjacent plots of land. The listed values are the yields of straw in cwt per acre, and the yields are paired by the plot of land that they share. Use a 0.05 significance level to test the claim that there is no difference between the yields from the two types of seed.

Regular	19.25	22.75	23	23	22.5	19.75	24.5	15.5	18	14.25	17
Kiln dried	25	24	24	28	22.5	19.5	22.25	16	17.25	15.75	17.25

a) State the null hypothesis and the alternative hypothesis.

b) Determine the significance level.

c) Calculate the test statistic.

d) Determine the *P* – value.

e) What is the conclusion?

4. Among 13,200 submitted abstracts that were blindly evaluated (with authors and institutions not identified), 26.7% were accepted for publication. Among 13,433 abstracts that were not blindly evaluated, 29.0% were accepted (based on data from “Effect of Blinded Peer Review on Abstract Acceptance,” by Ross, et al., *Journal of the American Medical Association*, Vol. 295, No. 14). Use a 0.01 significance level to test the claim that the acceptance rate is the same with or without blinding.

a) State the null hypothesis and the alternative hypothesis.

b) Determine the significance level.

c) Calculate the test statistic.

d) Determine the *P* – value.

e) What is the conclusion?

5. Listed below are Reading Ease scores taken from randomly selected pages in J. K. Rowlings *Harry Potter and the Sorcerer's Stone* and Leo Tolstoy's *War and Peace*. (Higher scores indicate writing that is easier to read.) Use a 0.02 significance level to test the claim that *Harry Potter and the Sorcerer's Stone* is easier ($\mu_1 > \mu_2$) to read than *War and Peace*.

Rowling:	85.3	84.3	79.5	82.5	80.2	84.6	79.2	70.9	78.6	86.2	74.0	83.7
Tolstoy:	69.4	64.2	71.4	71.6	68.5	51.9	72.2	74.4	52.8	58.4	65.4	73.6

$n_1 = 12$	$n_2 = 12$
$x_1 = 80.75$	$x_2 = 66.15$
$s_1 = 4.681$	$s_2 = 7.858$

a) State the null hypothesis and the alternative hypothesis.

b) Determine the significance level.

c) Calculate the test statistic.

d) Determine the *P* – value.

e) What is the conclusion?

6. The following table shows the weights of nine subjects before and after following a particular diet for two months. You wish to test the claim that the diet is effective in helping people lose weight at the 0.01 significance level.

Subject	A	B	C	D	E	F	G	H	I
Before	168	180	157	132	202	124	190	210	171
After	162	178	145	125	171	126	180	195	163

a) State the null hypothesis and the alternative hypothesis.

b) Determine the significance level.

c) Calculate the test statistic.

d) Determine the *P* – value.

e) What is the conclusion?