

STAT 250 Practice Problems Chapters 12, 13, 15

1. Use the data below to test at the 5% level whether the likelihood of developing breast cancer is different for the hormone group than the placebo group.

	Yes	No	Total
Hormone	166	8340	8506
Placebo	124	7978	8102
Total	290	16318	16608

2. Use the data and output below to test at the 5% level whether Religious preference and opinion on premarital sex are associated. The chi-square test statistic is 108.13 and the p-value is 1.4×10^{-7} . If the variables are independent, what is the expected cell count of Protestants who say premarital sex is never wrong?

Religion	Always	Almost Always	Sometimes	Never	Total
Protestant	221	54	98	288	661
Catholic	45	17	54	179	295
Jewish	2	1	8	18	29
None	15	10	32	164	221
Other	20	7	12	41	80
Total	303	89	204	690	1286

3. In a study comparing diet versus exercise, the 42 men on a diet lost an average of 7.2 kg with a standard deviation of 3.7 kg. The 47 men on an exercise regimen lost an average of 4.0kg with a standard deviation of 3.9kg. Conduct a hypothesis test at the .05 level to determine if there is a difference in mean weight loss for the two groups.
4. The forearm lengths for 9 men are given below. Is there evidence that mean forearm length is longer than the 25cm guideline used by a garment manufacturer? Test at the 5% level. 25.5, 24, 26.5, 25.5, 28, 27, 23, 25, 25. The sample average is 25.5 and the sample standard deviation is 1.5207.

5. A test of manual dexterity was given to students to determine if they perform better with their dominant hand than with their non-dominant hand. The data are presented below. Conduct a test at the 5% level.

Participant	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Mean	sd
Dominant	22	19	18	17	15	16	16	20	17	15	17	17	14	20	26	17.93	3.10
Nondominant	18	15	13	16	17	16	14	16	20	15	17	17	16	18	25	16.87	2.83
Difference	4	4	5	1	-2	0	2	4	-3	0	0	0	-2	2	1	1.07	2.43

6. The population of eligible voters in a region is 45.1% non-Hispanic white, 6.7% Black or African American, 28.8% Hispanic, 15.9% Asian, and 3.5% other. A sample of actual voters had the following racial/ethnic breakdown. Does the distribution of race/ethnicity for actual voters match that of eligible voters? Conduct a test at the .05 level.

White	93
Black or African American	13
Hispanic	43
Asian	24
Other	5
Total	178