

Math 186, Winter 2020, Prof. Tesler
Homework #9, Due Wednesday March 11, 2020

If you want to use this homework assignment to study for the final exam, please make a photocopy of it before you turn it in.

Please present your solutions in the order the problems are listed.

Larsen & Marx **Sixth Edition:**

7.4# 1(a,d), 2(c), 4, 7, 15, 17

Problem H-901

7.5# 1(a,c), 2(a,c), 3(a)

10.3# 7

10.5# 6

Problem H-902 / 11.2# 1

Problem H-903

Problem H-901. (Please do this in the order listed above, just after 7.4.17 and before 7.5.1.)

- (a) Problem 7.4.17 asked you to perform a one-sided hypothesis test to determine whether a worker's respiratory capacity is affected by exposure to the enzyme. Describe in words what "affected" means for that one-sided test.
- (b) State and perform the two-sided test for the exact same data as used in 7.4.17, at $\alpha = .05$, and again at $\alpha = .30$. Describe in words what "affected" means for the two-sided test.

Problem H-902.

- (a–c) Do problem 11.2.1, consisting of (a) the plot, (b) finding the equation of the least squares line, and (c) estimating the temperature.

For the plot, either use graph paper or provide a printout from EXCEL or other suitable software.

- (d) Compute the sample correlation coefficient, r , for the same data.

Note that the problem gives most of the sums that you'll need for (b) and (d), but you'll have to compute the sum of y_i^2 on your own.

Problem H-903. A microarray experiment is performed to find genes that are differentially expressed in two types of tissue. These measurements are at the same spot on the microarray for five specimens of Type A and four of Type B:

Type A:	0.33	0.41	0.33	0.53	0.60
Type B:	0.48	0.67	0.51	0.70	

- (a) (Chapter 7.5) For the Type A specimens, apply the χ^2 test for variance at a 5% significance level:

$$H_0: \sigma^2 = .01 \quad \text{vs.} \quad H_1: \sigma^2 \neq .01.$$

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- (b) **This part is not required and will not be graded. The material will be covered the last week of class.**

(Chapter 9.2) Use the two-sample t test to determine if the means of the two groups (Type A vs. Type B) are equal, at a 5% significance level:

$$H_0: \mu_A = \mu_B \quad \text{vs.} \quad H_1: \mu_A \neq \mu_B.$$