"Here's a job that I can do. 'Police are seeking third gunman.'
Tomorrow, I'm gonna march over to the police station and show them
that I'm the man they're looking for."

—Harry Solomon, 3rd Rock from the Sun

Problem 1: To investigate the effects of musical genre on consumer spending, a study was conducted at a single high-end restaurant over a 3-week period. Each participant was subjected to a certain background music and their total food bill was recorded, all of which is summarized in the table below.

Background Music	n	Mean Bill, $\overline{x}$	Standard Deviation, s
Classical	21	29.921	2.781
Pop	24	27.171	3.257
None	18	26.904	4.132

A partially completed ANOVA table for this experiment is provided below:

Source	DF	SS	MS	F
Groups				
Error		688.913		—
Total		804.516	—	—

(a) Complete the ANOVA table, rounding to 3 decimal places.

(b) Find the value of the pooled standard deviation, s_p. What conditions on the s do you need for s_p to be 'valid'?

(c) State the null and alternative hypotheses to be examined with an F-test, and draw your conclusions at a 5% significance level.

(d) Suppose that the researcher would like to determine whether the population mean spending with no background music is significantly lower than the average of the mean dining bills with the other two background types. Using an appropriate contrast, carry out the test at $\alpha = 0.05$.

Problem 2: A 3×5 two-way ANOVA was run with 4 observations per cell (treatment group); that is, Factor A has 3 levels and Factor B has 5 levels.

(a) Specify the degrees of freedom of the numerator and denominator for the F-statistic which is used to test for the interaction in this analysis.

(b) The calculated value for the F-statistic for the interaction was 1.74. Find the corresponding p-value (or a range for the p-value), and state your conclusions at $\alpha = 0.05$.

(c) Would you expect the interaction plot of the cell means to look parallel? Explain.