Practice Problems

Use this research scenario to answer questions 1 through 4.

A cognitive psychologist notices that it takes longer to recognize complex objects than simple objects. He believes this difference is because the recognition of complex objects requires more eye movements than simple objects and therefore takes more time to process. To test his hypothesis, he monitors the eye movements of four groups of 6 subjects, counting the number of fixations each subject makes when viewing one of four different shapes: a triangle, a pentagon, an octagon, and a dodecagon (a 12-sided polygon). The number of fixations used by each subject to correctly identify each object is shown in the table below.

Type of Shape

Triangle X_1	Pentagon X_2	Octagon X_3	Dodecagon X_4
1	2	2	5
2	3	4	6
1	4	5	6
2	4	5	6
2	3	4	5
1	3	5	7

1. Generate a null and research hypothesis.

2. Create a source table that includes:

    a. Source of Variation

    b. Sum of Squares

    c. Degrees of Freedom

    d. Mean Square

    e. F ratio

    f. P value and indicate whether to reject or fail to reject the null hypothesis.

3. If the F ratio is significantly large enough to reject the null hypothesis, then compute an HSD to determine which levels of the independent variable are significantly different from one another.

4. State the conclusion for this analysis.

Use this research scenario to answer questions 5 through 8.

A drug company recently released a new antipsychotic drug that it claims decreases the delusions associated with schizophrenia. A psychiatrist and a psychobiologist are interested in determining the effective dosage of the new drug. They randomly assign 5 schizophrenics to one of three dosage conditions: A, B, and C. The average daily number of expressed delusions for each subject is shown in the table below.

Dosage condition

A X_1	B X_2	C X_3
22	16	5
20	14	7
19	12	4
17	17	9
27	15	8

5. Generate a null and research hypothesis.

6. Create a source table that includes:

   a. Source of Variation

   b. Sum of Squares

c. Degrees of Freedom

d. Mean Square

e. F ratio

f. P value and indicate whether to reject or fail to reject the null hypothesis.

7. If the F ratio is significantly large enough to reject the null hypothesis, then compute an HSD to determine which levels of the independent variable are significantly different from one another.

8. State the conclusion for this analysis.