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MATH 1281-01 Statistical Inference – AY2025-T3

The screenshot shows the SPSS ANOVA dialog box with 'Complaints' as the dependent variable and 'Region' as the fixed factor. The 'Display' section is set to show descriptive statistics, estimates of effect size, and confidence intervals. The 'Results' window displays the following data:

Descriptive Statistics

	Complaints			
	1	2	3	4
Valid	5	5	5	5
Missing	0	0	0	0
Mean	1.000	1.400	3.600	4.200
Std. Deviation	1.225	1.140	1.140	0.837
Minimum	0.000	0.000	2.000	3.000
Maximum	3.000	3.000	5.000	5.000

ANOVA

Cases	Sum of Squares	df	Mean Square	F	p
Region	37.750	3	12.583	10.486	< .001
Residuals	19.200	16	1.200		

Note. Type III Sum of Squares

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(a) Descriptive Statistics Explanation:

1. Region with the highest average complaints:

- Region 4 has the highest mean number of complaints.
- Average (Mean) = 4.200



2. **Region with the largest standard deviation of complaints:**

- Region 1 has the highest standard deviation.
- **Standard Deviation = 1.225**

3. **Expecting differences in the average number of complaints across the four regions:**

- Yes, the means differ across regions (1.000, 1.400, 3.600, and 4.200), suggesting variability.
- The standard deviations also vary, showing differences in the spread of complaints.
- However, to confirm if these differences are statistically significant, we need to check the ANOVA results.

(b) Hypotheses for Evaluating Differences in Complaints Across Regions:

- **Null Hypothesis (H₀):** There is no significant difference in the average number of complaints across the four regions.
- **Alternative Hypothesis (H_a):** There is a significant difference in the average number of complaints across the four regions.

ANOVA

ANOVA - Complaints

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Region	37.750	3	12.583	10.486	< .001
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(c) ANOVA Analysis Results:

1. F-statistic and p-value:

- F-statistic = 10.486
- p-value < 0.001

2. Conclusion for the hypothesis:

- Since the p-value is **less than 0.05**, we **reject the null hypothesis**.
- This means there is a **statistically significant difference** in the average number of complaints across the four regions.