TEST FOR INDEPENDENCE

TEXT:

LAST NAME	FIRST NAME	DATE

1 (6 points)**.** A random sample of 755 drivers is taken, and two variables are measured: $V =$ the driver has a speeding violation, and $C =$ the driver reports using mobile phone while driving. The data is summarized in the following table. Run a test for independence with 10% significance level.

	C	C'	Total
V	125	85	210
V'	305	240	545
Total	430	325	755

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V			210
V'			545
Total	430	325	755

Fill out the table above with expected frequencies.

(a) H_0 : H_1 :

(b) State the distribution of the test statistic:

(c) Sketch a graph of the distribution of the test statistic, find and label the critical point(s), shade the rejection region.

(d) Compute the test statistic and sketch it on the graph above.

(e) Find the p-value of the test.

(f) State the conclusion.

2 (2 points)**.** A Chi-squared test for independence applied to a contingency table with 4 columns and 3 rows yields the test statistic $\chi_0^2 = 10$. Compute the p-value for this test.

3 (6 points)**.** A random sample of people produces the following data for the type of car they drive, and the type of music they prefer to listen to while driving. Of interest is whether these two variables are independent.

	Sedan	Truck	Sports Car
Pop	47	22	18
Rap	40	19	21
Classical	24	9	12
Rock	30	5	48
Other	14	2	10

(a) State the distribution of the test statistic for the Chi-squared test for independence.

(b) State the value of the test statistic.

(c) Find the p-value of this test, make a sketch of the distribution of the test statistic, and shade the p-value.

(d) State the conclusion using 5% significance level.