

UNIVERSITY OF TEXAS AT AUSTIN

Quiz # 13

The goodness-of-fit test. The χ^2 –test of independence.

Provide your **complete solution** to the following problems.

Problem 13.1. (7 points)

A die is rolled 60 times and the face values are recorded. The results are as follows:

Up face	1	2	3	4	5	6
Number of occurrences	8	11	0	12	20	9

Using your χ^2 –tables, at the 5% significance level, test the hypothesis that the die is fair.

Problem 13.2. (8 points) *Source: "Probability and Statistics for Engineers and Scientists" by Walople, Myers, Myers, and Ye.*

Suppose that we wish to determine whether the opinions of the voting residents of the state of Illinois concerning the new tax reform are independent of their levels of income. Members of a random sample of 1000 registered voters from the state of Illinois were classified as to whether they are in a *low*, *medium*, or *high* income bracket and whether or not they favor the tax reform. Here are the results:

	Income level			
Tax reform	Low	Medium	High	Total
For	182	213	203	598
Against	154	138	110	402
Total	336	351	313	1000

Using your χ^2 – tables, at the significance level of 0.01, test the null hypothesis of independence.