

Quiz 7  
12 points

Math 107

Pledged

Key

You have a tetrahedron die (four sided) and suspect that it is unfair. To check this out you roll the die 40 times and get the following information:

Number on the die:	1	2	3	4
Number of times rolled (Observed)	8	12	15	5
$E = np = 40 \cdot \frac{1}{4}$	10	10	10	10

Check the "fairness" of this coin by performing a Goodness-of-fit test:  $\sum \frac{(O-E)^2}{E}$

with  $k-1$  degrees of freedom. Show all work and give your conclusion clearly.

Null Hypothesis: The die is fair

$$\chi^2 = \frac{(8-10)^2}{10} + \frac{(12-10)^2}{10} + \frac{(15-10)^2}{10} + \frac{(5-10)^2}{10}$$
$$= .4 + .4 + 2.5 + 2.5 = 5.8$$

test statistic: 5.8

Critical value at alpha of .05: 7.815  $df = 3$

Conclusion and interpretation: Fail to reject the null hypothesis.

There is insufficient evidence to conclude that the die is unfair.