Answer on Question #85920 – Math – Statistics and Probability

Question

A dice is tossed 120 times with the following results:

Number turned up	Frequency
1	30
2	25
3	18
4	10
5	22
6	15

Test the hypothesis that the dice is unbiased.

Solution

Null Hypothesis: Set up the null hypothesis that the dice is unbiased. On the basis of hypothesis that the dice is unbiased, we expect each number to turn up,

$$\frac{30+25+18+10+22+15}{6} = 20 \text{ times}$$

Apply χ^2 −test (Chi Square Test)

O	E	$(O-E)^2$	$\frac{(O-E)^2}{E}$
30	20	100	5
25	20	25	1.25
18	20	4	0.2
10	20	100	5
22	20	4	0.2
15	20	25	1.25
			$\sum \frac{(O-E)^2}{E} = 12.9$

No of degrees of freedom $= n - 1 = 6 - 1 = 5$

For 5 degrees of freedom at 5% level of significance, the table value of χ^2 is 11.07. The calculated value of χ^2 is greater than the table value and hence we reject the null hypothesis that dice is unbiased.
We conclude that the dice is biased.