

### Answer on Question #55134 – Math – Statistics and Probability

The probability of individuals with blood types A, B, AB and O are 0.45, 0.13, 0.06 and 0.36, respectively. A geneticist tested 100 individual blood types and found that 40 had type A, 18 had type B, 5 had type AB and 37 had type O. Use goodness of fit test at 5% level of significance to test whether the observed frequencies closely correspond to the theoretical ones.

#### Solution

Test statistic is

$$\chi^2 = \frac{(40 - 45)^2}{45} + \frac{(18 - 13)^2}{13} + \frac{(5 - 6)^2}{6} + \frac{(37 - 36)^2}{36} = 2.673.$$

The critical value for  $4 - 1 = 3$  degrees of freedom and 5% level of significance is

$$\chi_{crit}^2 = 7.82.$$

$\chi^2 < \chi_{crit}^2$ , thus the observed frequencies closely correspond to the theoretical ones.