One coin is thrown 100 times. What is the probability of getting a tail as an odd number?

Solution:

Let p = Probability of getting tail = 1 / 2

q = Probability of getting head = 1 / 2

Also, p + q = 1 and n = 100

Required probability = P (X = 1) + P (X = 3) +….. + P (X = 99)

$= {}^{100}C_1 * p * q^{99} + {}^{100}C_3 * p^3 * q^{97} + \ldots\ldots + {}^{100}C_{99} * p^{99} * q^1$

$= [(p + q)^{100} - (p - q)^{100}] / [2]$

= 1 / 2.