Assignment 5

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Question: In a certain lottery 10,000 tickets are sold and ten equal prizes are awarded. What is the probability of not getting a prize if you buy

(a) 1 ticket?
(b) 2 tickets?
(c) 10 tickets?

Solution: Total number of tickets sold = 10,000
Number of equal prizes awarded = 10
The number of tickets that are not awarded = 9990

(a) If we buy one ticket:

$$\Pr\left(\text{not getting a prize}\right) = 1 - \frac{10}{10000} \quad (1)$$

$$= \frac{999}{1000} \quad (2)$$

(b) If we buy 2 tickets:
As we know the favourable outcomes are obtained by selecting 2 tickets from 9990 tickets that are not awarded any prize, then

$$\Pr\left(\text{not getting a prize}\right) = \frac{^{9990}C_2}{^{10000}C_2} \quad (3)$$

(c) If we buy 10 tickets:
As we know the favourable outcomes are obtained by selecting 10 tickets from 9990 tickets that are not awarded any prize, then

$$\Pr\left(\text{not getting a prize}\right) = \frac{^{9990}C_{10}}{^{10000}C_{10}} \quad (4)$$