

Assignment 1

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Problem 10.15.1.8:-

A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is (i) red ? (ii) not red?

Solution:-

Number of red balls in the bag = 3

Number of black balls in the bag = 5

Total number of balls in the bag = $3 + 5 = 8$

Let X be a Bernoulli random variable, such that $X \sim \text{Ber}(p)$.

$$X = \begin{cases} 1 & \text{if drawn ball is red} \\ 0 & \text{otherwise.} \end{cases} \quad (1)$$

(i) Probability that the drawn ball is red

$$= P(X = 1) \quad (2)$$

$$= \frac{\text{Number of red balls}}{\text{Total number of balls}} = \boxed{\frac{3}{8}} \quad (3)$$

$$\implies p = \frac{3}{8} \quad (4)$$

(ii) Probability that the drawn ball is not red

$$= P(X = 0) \quad (5)$$

$$= 1 - p = 1 - \frac{3}{8} = \boxed{\frac{5}{8}} \quad (6)$$