

# Assignment 3

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## CBSE Probability Grade 10

**Exercise 15.1 Q13:** A die is thrown once. Find the probability of getting

- (i) a prime number
- (ii) a number lying between 2 and 6
- (iii) an odd number

**Solution:** Let the random variable  $X$  denote the number that appears on rolling the die. The sample space is  $S = \{1, 2, 3, 4, 5, 6\}$ . The CDF can be obtained from the PMF as follows:

$$F_X(k) = \sum_{i=1}^{i=k} \Pr(X = i) = k \times \frac{1}{6} = \frac{k}{6} \quad (1)$$

Hence, using Fig.1

- (i) The probability of getting a prime number

$$= \Pr(X = 2) + \Pr(X = 3) + \Pr(X = 5) \quad (2)$$

$$= 3 \times \frac{1}{6} \quad (3)$$

$$= \frac{3}{6} \quad (4)$$

$$= 0.5 \quad (5)$$

- (ii) The probability of getting a number lying between 2 and 6 is

$$\Pr(2 < X \leq 5) = F_X(5) - F_X(2) \quad (6)$$

$$= \frac{5}{6} - \frac{2}{6} \quad (7)$$

$$= \frac{3}{6} \quad (8)$$

$$= 0.5 \quad (9)$$

$$= \sum_{i=0}^{i=2} \Pr(X = 2 \times i + 1) \quad (10)$$

$$= 3 \times \frac{1}{6} \quad (11)$$

$$= \frac{3}{6} \quad (12)$$

$$= 0.5 \quad (13)$$

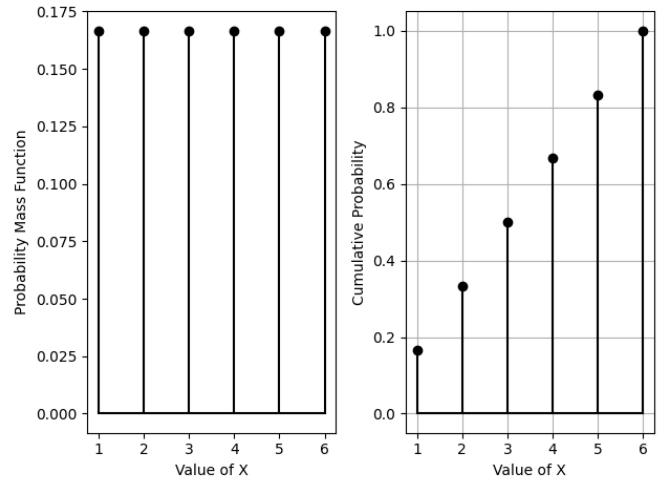


Fig. 1. Plot of the PMF (left) and CDF (right) of an unbiased die

- (iii) The probability of getting an odd number