

# Probability and random variables assignment

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1 Q 24

**Abstract**—This section provides the solution to Q24 of EX 15.1 in CBSE class 10th NCERT textbook of mathematics

1.1. A die is thrown twice. What is the probability that:

- (i) 5 will not come up either time?
- (ii) 5 will come up at least once?

**Solution:**

Let  $X \in \{1, 2, 3, 4, 5, 6\}$  be a random variable representing the number obtained on the first throw of the dice.

Similarly, Let  $Y \in \{1, 2, 3, 4, 5, 6\}$  be a random variable representing the number obtained on the second throw of the dice.

For our case  $X$  is independent of  $Y$ .

Inputting values in (1.1.4) from the table:

$$P = \left(1 - \frac{1}{6}\right) \left(1 - \frac{1}{6}\right) \quad (1.1.6)$$

$$\Rightarrow P = \frac{25}{36} \quad (1.1.7)$$

(ii)

Since the event  $M(\text{say}) = \text{"not getting 5 on either throw of dice"}$  and event  $N(\text{say}) = \text{"getting atleast one 5"}$  are exhaustive events:

$$P(M) + P(N) = 1 \quad (1.1.8)$$

$$\Rightarrow P(N) = 1 - P(M) \quad (1.1.9)$$

$$\therefore P(N) = \frac{11}{36} \quad (1.1.10)$$

TABLE 1.1.1

Random variables	Value	Probability
X/Y	1	1/6
X/Y	2	1/6
X/Y	3	1/6
X/Y	4	1/6
X/Y	5	1/6
X/Y	6	1/6

(i)

we are required to find  $P((X \neq 5) \cap (Y \neq 5))$   
we know by Conditional probability that:

$$P(A \cap B) = P(A|B) \times P(B) \quad (1.1.1)$$

$$(1.1.2)$$

$$\text{Let : } P = P((X \neq 5) \cap (Y \neq 5)) \quad (1.1.3)$$

$$\Rightarrow P = P(X \neq 5) \times P(Y \neq 5) \quad (1.1.4)$$

$$\Rightarrow P = (1 - P(X = 5))(1 - P(Y = 5)) \quad (1.1.5)$$