

PROBABILITY

T SIVA PARVATHI - FWC22089

13.4.5 ¹ Find the probability distribution of the number of successes in two tosses of a die, where a success is defined as

- (a) number greater than 4
- (b) six appears on at least one die

Solution: Given that a die tossed two times,

RV	Values	Description
X1	{0,1}	first toss of a die
X2	{0,1}	second toss of a die

Table 2: Random Variables(RV) X and Y

- (a) number greater than 4

$$\Pr(X_1 > 4) = 1 - \Pr(X_1 \leq 4) \quad (13.4.1.1)$$

$$\begin{aligned} \Pr(X_1 > 4) &= 1 - (\Pr(X_1 = 1) + \Pr(X_1 = 2) + \Pr(X_1 = 3) + \Pr(X_1 = 4)) \\ \Pr(X_1 > 4) &= 1 - \frac{4}{6} = \frac{1}{3} \end{aligned}$$

$$\Pr(X_2 > 4) = 1 - \Pr(X_2 \leq 4) \quad (13.4.1.2)$$

$$\Pr(X_1 > 4) = 1 - \frac{4}{6} = \frac{1}{3}$$

$$\text{Probability distribution of two independent events, } \Pr(X_1 > 4) \times \Pr(X_2 > 4) = \frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$$

- (b) six appears on at least one die

$$\Pr(01, 10, 11) = \frac{11}{36} \quad (13.4.2.3)$$

¹Read question numbers as (CHAPTER NUMBER).(EXERCISE NUMBER).(QUESTION NUMBER)