

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
X	{0,1,2}	getting number greater than 4 on a die
Y	{0,1}	getting number 6 on atleast one die

Table 2: Random Variables(RV) X and Y

- (a) number greater than 4
when we throw a die twice, there are three cases
X=0 means no number greater than 4
X=1 means 1 number greater than 4
X=2 means 2 numbers greater than 4

$$p_X(k) = \Pr(X = k) = \begin{cases} \frac{4}{9}, & k = 0 \\ \frac{4}{9}, & k = 1 \\ \frac{1}{9}, & k = 2 \end{cases} \quad (13.4.1.1)$$

- (b) six appears on at least one die

there are two cases,

Y=0 means number 6 doesnot appear at all

Y=1 means number 6 appears atleast on one die

$$\Pr(Y = 1) = \frac{11}{36} \quad (13.4.2.2)$$

$$\Pr(Y = 0) = 1 - \Pr(Y = 1) = \frac{25}{36} \quad (13.4.2.3)$$

$$p_Y(k) = \Pr(Y = k) = \begin{cases} \frac{25}{36}, & k = 0 \\ \frac{11}{36}, & k = 1 \end{cases} \quad (13.4.2.4)$$

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