

# NCERT 11.16.3.33

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Question:11.16.3.33

If A and B are two candidates seeking admission in an engineering College. The probability that A is selected is 0.5 and the probability that both A and B are selected is atmost 0.3. Is it possible that the probability of B getting selected is 0.7?

**Solution:**

Define a random variables X as:

Parameter	Value	Description
X	X=0	Probability of A beging selected
	X=1	Probability of B beging selected

TABLE 0: Random Variables

Given that,

$$\Pr((X = 0)(X = 1)) \leq 0.3 \quad (1)$$

$$p_X(0) = 0.5 \quad (2)$$

We know that,

$$\Pr((X = 0) + (X = 1)) \leq 1 \quad (3)$$

$$\Pr((X = 0) + (X = 1)) = p_X(0) + p_X(1) - \Pr((X = 0)(X = 1)) \quad (4)$$

$$\Rightarrow \Pr((X = 0)(X = 1)) = p_X(0) + p_X(1) - \Pr((X = 0) + (X = 1)) \quad (5)$$

$$\Rightarrow p_X(0) + p_X(1) - \Pr((X = 0) + (X = 1)) \leq 0.3 \quad (6)$$

$$\Rightarrow p_X(0) + p_X(1) \leq 0.3 + \Pr((X = 0) + (X = 1)) \quad (7)$$

$$\Rightarrow p_X(0) + p_X(1) \leq 0.3 + 1 \quad (8)$$

$$\Rightarrow 0.5 + p_X(1) \leq 1.3 \quad (9)$$

$$\Rightarrow p_X(1) \leq 0.8 \quad (10)$$

$\therefore$  It is possible that the probability of B getting selected is 0.7.

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