Ncert exempler

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Question 12.13.3.38

A and B throw a pair of dice alternately. A wins the game if he gets a total of 6 and B wins if she gets a total of 7. It A starts the game, find the probability of winning the game by A in third throw of the pair of dice.

Solution: Let $X = \{X_1, X_2\}$be a random variable represent sum on dice.

X=$(X_1 + X_2 \leq 12)$

$$p\left(X_1 + X_1 = 6\right) = \frac{5}{36} \tag{1}$$

$$p\left(X_1 + X_2 \neq 6\right) = 1 - \frac{5}{36} = \frac{31}{36} \tag{2}$$

$$p\left(X_1 + X_2 = 7\right) = \frac{6}{36} \tag{3}$$

$$p\left(X_1 + X_2 \neq 7\right) = 1 - \frac{6}{36} = \frac{30}{36} \tag{4}$$

For A to win in third throw

$$P\left(A\right) = p\left(X_1 + X_2 \neq 6\right) p\left(X_1 + X_2 \neq 7\right) p\left(X_1 + X_2 = 6\right) \tag{5}$$

$$= \frac{31}{36} \times \frac{30}{36} \times \frac{5}{36} \tag{6}$$

$$= 0.09 \tag{7}$$