Assignment 5

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I. PROBLEM-CBSE-11 EX:16 Q)2

Q) 4 cards are drawn from a well-shuffled deck of 52 cards. What is the probability of obtaining 3 diamonds and one spade?

II. SOLUTION

Let X and Y be events defined as,
X : "Picking three diamond card."
Y : "Picking a spade card."

$$n(X) = {}^{13}C_3 \tag{1}$$
$$n(Y) = {}^{13}C_1 \tag{2}$$
$$n(X \cap Y) = {}^{13}C_3 \times {}^{13}C_1 \tag{3}$$
$$n(S) = {}^{52}C_4 \tag{4}$$

Where S is the sample space.

Now, probability of getting 3 diamonds and 1 spade is given by,

$$Pr(X \cap Y) = \frac{n(X \cap Y)}{n(S)} \tag{5}$$
$$Pr(X \cap Y) = \frac{{}^{13}C_3 \times {}^{13}C_1}{{}^{52}C_4} \tag{6}$$
$$Pr(X \cap Y) = \frac{286}{20285} \tag{7}$$
$$Pr(X \cap Y) = 0.0137 \tag{8}$$

$\therefore$ probability of getting 3 diamonds and 1 spade is 0.0137