

Assignment 1

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- 1) Two cards are drawn at random and without replacement from a pack of 52 playing cards. Find the probability that both the cards are black.

Solution: Consider the random variables X, Y as described in the table 1.

RV	Values	Description
X	$\{0, 1\}$	2 cards are drawn
Y	$\{0, 1\}$	0: black card, 1: red card
X, Y	$\{00, 10\}$	2 cards drawn are black

TABLE 1: Random variables X, Y

Given that the cards are drawn without replacement. Thus, the required probability is given by

$$\begin{aligned} \Pr(00, 10) &= \frac{{}^{26}C_2}{{}^{52}C_2} & (0.0.1) \\ &= \frac{25}{102} & (0.0.2) \end{aligned}$$