

Solution 11.16.3.4

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Question 4 A card is selected from a pack of 52 cards

- (a) How many points are there in the sample space?
- (b) Calculate the probability that the cards is an ace of spades.
- (c) Calculate the probability that the card is (i) an ace (ii)black card.

- (c) The probability when the card choosen is ,
 - (i) an ace

$$\Pr(Z = 1) = \frac{1}{13}. \quad (8)$$

- (ii) black card

$$\Pr(X = 1) = \frac{1}{2}. \quad (9)$$

Solution: S is a sample space of given cards ,
Let the random variables(r.v), where X,Y and Z are uniformly distributed r.v's.

TABLE 3
RANDOM VARIABLE AND PROBABILITY TABLE

Random independent variable	value of R.V
X(denotes colour)	1,2
Y(denotes type of card)	1,2,3,4
Z(denotes value of card chosen)	$1 \leq Z \leq 13$

$$\Pr(X) = \frac{26}{52} = \frac{1}{2} \quad (1)$$

$$\Pr(Y) = \frac{13}{52} = \frac{1}{4} \quad (2)$$

$$\Pr(Z) = \frac{4}{52} = \frac{1}{13} \quad (3)$$

$$(4)$$

- (a) The number of sample space points is 52
- (b)

$$\Pr(Y = 1, Z = 1) = \Pr(Y = 1) \Pr(Z = 1) \quad (5)$$

$$= \left(\frac{1}{4}\right) \left(\frac{1}{13}\right) \quad (6)$$

$$= \frac{1}{52} \quad (7)$$

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