

# Question 11.16.3.15

## Probability and Random Processes

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### Question:11/16/3/15

A card is drawn from a deck of 52 cards. Find the probability of getting a king or a heart or a red card.

**Solution:**

parameters	values	decription
X	1	red card
	0	not a red card
Y	1	king
	0	not a king

TABLE 0: Random variable description

Hearts is a subset of red cards,hence X covers it.Then the probabilities are

$$p_{XY}(xy) = \begin{cases} \frac{1}{26} & x = 1, y = 1 \\ \frac{12}{13} & x = 1, y = 0 \\ \frac{1}{26} & x = 0, y = 1 \\ \frac{6}{13} & x = 0, y = 0 \end{cases} \quad (1)$$

The desired probability is

$$= p_{XY}(11) + p_{XY}(10) + p_{XY}(01) \quad (2)$$

$$= 1 - p_{XY}(00) \quad (3)$$

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

$$= \frac{7}{13} \quad (5)$$