

Probability

Que 1:

Marks :(4)

*Cards are drawn from a pack of 52 cards one by one.
Find the probability that exactly 10 cards will be drawn before the first ace?*

Ans:

Required event = drawing 10 non ace cards and then drawing an ace in 11th draw.

$$\begin{aligned} \text{Required probability} &= \frac{48}{52} \times \frac{47}{51} \times \frac{46}{50} \times \frac{45}{49} \times \frac{44}{48} \times \frac{43}{47} \times \\ &\frac{42}{46} \times \frac{41}{45} \times \frac{40}{44} \times \frac{39}{43} \times \frac{4}{42} = \frac{164}{4165} \end{aligned}$$

Que 2:

Marks :(2)

Required event = drawing 10 non ace cards and then drawing an ace in 11th draw.

$$\begin{aligned} \text{Required probability} &= \frac{48}{52} \times \frac{47}{51} \times \frac{46}{50} \times \frac{45}{49} \times \frac{44}{48} \times \frac{43}{47} \times \\ &\frac{42}{46} \times \frac{41}{45} \times \frac{40}{44} \times \frac{39}{43} \times \frac{4}{42} = \frac{164}{4165} \end{aligned}$$

Ans:

$$\text{Probability of getting first ace} = \frac{4}{52}$$

$$\text{Probability of getting second ace} = \frac{4}{52}$$

$$\text{Required probability} = \frac{4}{52} \times \frac{4}{52} = \frac{1}{169}$$