**Playing Cards Probability**

Top of Form





Bottom of Form

Playing cards probability problems based on a well-shuffled deck of 52 cards.

Basic concept on drawing a card:

In a pack or deck of 52 playing cards, they are divided into 4 suits of 13 cards each i.e. spades ♠ hearts ♥, diamonds ♦, clubs ♣.

Cards of Spades and clubs are black cards.

Cards of hearts and diamonds are red cards.

The card in each suit, are ace, king, queen, jack or knaves, 10, 9, 8, 7, 6, 5, 4, 3 and 2.

King, Queen and Jack (or Knaves) are face cards. So, there are 12 face cards in the deck of 52 playing cards.

Worked-out problems on Playing cards probability:

**1.** A card is drawn from a well shuffled pack of 52 cards. Find the probability of:

(i) ‘2’ of spades

(ii) a jack

(iii) a king of red colour

(iv) a card of diamond

(v) a king or a queen

(vi) a non-face card

(vii) a black face card

(viii) a black card

(ix) a non-ace

(x) non-face card of black colour

(xi) neither a spade nor a jack

(xii) neither a heart nor a red king

**Solution:**

In a playing card there are 52 cards.

Therefore the total number of possible outcomes = 52

**(i)** ‘2’ of spades:

Number of favourable outcomes i.e. ‘2’ of spades is 1 out of 52 cards.

Therefore, probability of getting ‘2’ of spade

*Number of favorable outcomes  
P(A) =     Total number of possible outcome*   
  
      = 1/52

**(ii)** a jack

Number of favourable outcomes i.e. ‘a jack’ is 4 out of 52 cards.

Therefore, probability of getting ‘a jack’

*Number of favorable outcomes  
P(B) =     Total number of possible outcome*   
  
      = 4/52  
      = 1/13

**(iii)** a king of red colour

Number of favourable outcomes i.e. ‘a king of red colour’ is 2 out of 52 cards.

Therefore, probability of getting ‘a king of red colour’

*Number of favorable outcomes  
P(C) =     Total number of possible outcome*   
  
      = 2/52  
      = 1/26

**(iv)** a card of diamond

Number of favourable outcomes i.e. ‘a card of diamond’ is 13 out of 52 cards.

Therefore, probability of getting ‘a card of diamond’

*Number of favorable outcomes  
P(D) =     Total number of possible outcome*   
  
      = 13/52  
      = 1/4

**(v)** a king or a queen

Total number of king is 4 out of 52 cards.

Total number of queen is 4 out of 52 cards

Number of favourable outcomes i.e. ‘a king or a queen’ is 4 + 4 = 8 out of 52 cards.

Therefore, probability of getting ‘a king or a queen’

*Number of favorable outcomes  
P(E) =     Total number of possible outcome*   
  
      = 8/52  
      = 2/13

**(vi)** a non-face card

Total number of face card out of 52 cards = 3 times 4 = 12

Total number of non-face card out of 52 cards = 52 - 12 = 40

Therefore, probability of getting ‘a non-face card’

*Number of favorable outcomes  
P(F) =     Total number of possible outcome*   
  
      = 40/52  
      = 10/13

**(vii)** a black face card:

Cards of Spades and Clubs are black cards.

Number of face card in spades (king, queen and jack or knaves) = 3

Number of face card in clubs (king, queen and jack or knaves) = 3

Therefore, total number of black face card out of 52 cards = 3 + 3 = 6

Therefore, probability of getting ‘a black face card’

*Number of favorable outcomes  
P(G) =     Total number of possible outcome*   
  
      = 6/52  
      = 3/26

**(viii)** a black card:

Cards of spades and clubs are black cards.

Number of spades = 13

Number of clubs = 13

Therefore, total number of black card out of 52 cards = 13 + 13 = 26

Therefore, probability of getting ‘a black card’

*Number of favorable outcomes  
P(H) =     Total number of possible outcome*   
  
      = 26/52  
      = 1/2

**(ix)** a non-ace:

Number of ace cards in each of four suits namely spades, hearts, diamonds and clubs = 1

Therefore, total number of ace cards out of 52 cards = 4

Thus, total number of non-ace cards out of 52 cards = 52 - 4

= 48

Therefore, probability of getting ‘a non-ace’

*Number of favorable outcomes  
P(I) =     Total number of possible outcome*   
  
      = 48/52  
      = 12/13

**(x)** non-face card of black colour:

Cards of spades and clubs are black cards.

Number of spades = 13

Number of clubs = 13

Therefore, total number of black card out of 52 cards = 13 + 13 = 26

Number of face cards in each suits namely spades and clubs = 3 + 3 = 6

Therefore, total number of non-face card of black colour out of 52 cards = 26 - 6 = 20

Therefore, probability of getting ‘non-face card of black colour’

*Number of favorable outcomes  
P(J) =     Total number of possible outcome*   
  
      = 20/52  
      = 5/13

**(xi)** neither a spade nor a jack

Number of spades = 13

Total number of non-spades out of 52 cards = 52 - 13 = 39

Number of jack out of 52 cards = 4

Number of jack in each of three suits namely hearts, diamonds and clubs = 3

[Since, 1 jack is already included in the 13 spades so, here we will take number of jacks is 3]

Neither a spade nor a jack = 39 - 3 = 36

Therefore, probability of getting ‘neither a spade nor a jack’

*Number of favorable outcomes  
P(K) =     Total number of possible outcome*   
  
      = 36/52  
      = 9/13

**(xii)** neither a heart nor a red king

Number of hearts = 13

Total number of non-hearts out of 52 cards = 52 - 13 = 39

Therefore, spades, clubs and diamonds are the 39 cards.

Cards of hearts and diamonds are red cards.

Number of red kings in red cards = 2

Therefore, neither a heart nor a red king = 39 - 1 = 38

[Since, 1 red king is already included in the 13 hearts so, here we will take number of red kings is 1]

Therefore, probability of getting ‘neither a heart nor a red king’

*Number of favorable outcomes  
P(L) =     Total number of possible outcome*   
  
      = 38/52  
      = 19/26

These are the basic problems on ***probability* with *playing cards.***