

Probability assignment

[Science](#), [Statistics](#)



A 7-card hand is chosen from a standard 52-card deck. a. How many of these will have four spades and three hearts?

Number of ways to pick four spades = $13 C 4 = 715$

Number of ways to pick three hearts = $13 C 3 = 286$

Therefore, there would be $[13 C 4 * 13 C 3] = 204, 490$

b. What is the probability that we draw a hand composed of precisely four spades and three hearts?

Number of ways to pick 7 cards randomly: $52 C 7 = 133, 784, 560$

Therefore, probability = $[13 C 4 * 13 C 3] / (52 C 7) = 0. 001528$

(2) A committee of 3 people is to be selected from a group of 8 people, which includes 4 married couples. If the committee cannot contain more than one member of any married couple, how many 3-person committees are possible?

For the first member of the committee, there are 8 possibilities. Once one member is selected, not only is that person eliminated, but his or her spouse is, as well. That leaves 6 possibilities for the second person. Then another person is eliminated, as is another spouse. Finally, there are 4 possibilities for the remaining spot. So, there are $(8)(6)(4)$ permutations, for a total of 192. Since the committee consists of 3 members, there are $3!$ possible permutations of any committee. Thus, we need to divide the number of permutations by 6 to get the number of combinations:

$(8)(6)(4) / 6 = 8(4) = 32$ three-person committees

(3) How many different four letter words can be formed (the words need not be meaningful) using the letters of the word SUMMER?

Since the order of letter is significant and repetition is not allowed in this case, then –

--- $\text{C}(6 P 4) / 2!$ Which eliminates the repeating of M

--- $\text{C} 360 / 2$ --- C thus, there are 180 different four-letter words that can be formed out of the word SUMMER

(4) Ten coins are tossed simultaneously. In how many ways will the third coin turn up a head?

When a coin is tossed once, there are two outcomes. It can turn up a head or a tail. When 10 coins are tossed simultaneously, the total number of outcomes = 210. In this event, if the third coin were to turn up a head, then the number of possibilities for the third coin is only 1 as the outcome is fixed as head. Therefore, the remaining 9 coins can turn up either a head or a tail equals 29.

(5) In how many ways can 5 envelopes be posted in 3 mail boxes, if any number of envelopes can be posted in all of the three boxes?

The first envelope can be posted in any of the 3 mailboxes. Hence, there are 3 choices for it. Similarly, each of the other four envelopes can be posted in any of the 3 mailboxes. Therefore, the total number of ways these 5 envelopes can be posted in the 3 mailboxes is $3 \times 3 \times 3 \times 3 \times 3 = 3^5 = 243$.