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## The Hypergeometric Distribution - Quiz

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### Question 1

1/1 point (graded)

According to the description given in class, which of the following are likely to be characterized by the hypergeometric distribution?


- ☐ a. The number of shots a basketball player makes out of the next 50 shot attempts
- ☐ b. At an ice cream shop, the number of customers out of the next 100 that choose chocolate
- ☒ c. The number of red cards drawn from a regular deck 52 cards, where cards are not replaced in successive draws ✓
- ☐ d. The number of red cards drawn from a regular deck 52 cards, where cards are replaced in successive draws

### Explanation


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### **Human Subjects and Special Distributions**

[Finger Exercises due Nov 07, 2016 at 05:00 IST](#) 

### **The Sample Mean, Central Limit Theorem, and Estimation**

[Finger Exercises due Nov 07, 2016 at 05:00 IST](#) 

### **Module 6: Homework**

[Homework due Oct 31, 2016 at 05:00 IST](#) 

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Similar to the binomial, the hypergeometric distribution models a sequence of success/failure trials. However, the key difference is that in the binomial models the case of sampling with replacement (where the probability of success remains constant over time), while the hypergeometric models the case of sampling without replacement (in other words, the probability of success changes over time depending on the number of successes and failures already drawn). A standard deck of cards contains 26 red and 26 black cards. A hypergeometric distribution models the outcome of 10 draws from the deck where cards are not replaced after each draw. If cards were replaced after each draw, then the sequence of 10 draws could be modeled using the binomial.

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You have used 1 of 2 attempts

✓ Correct (1/1 point)

## Question 2

1/1 point (graded)

Let's look more closely at the example of a deck of 52 cards, where 13 are clubs, 13 are diamonds, 13 are spades, and 13 are hearts. Suppose that you sample 10 cards from the deck without replacing the cards. What is the probability that exactly five of the cards are hearts?

*Please round your answer to three decimal places, i.e. if it is 0.5677, please round to 0.568.*

0.047

✓ Answer: 0.047

0.047

Explanation

Using the formula given in class,  $(X|A, B, n) = \frac{\binom{A}{x} \binom{B}{n-x}}{\binom{A+B}{n}}$ , where  $x = 5$  (5 hearts),  $n = 10$  (10 draws),

$A = 13$  (number of hearts in the full deck), and  $B = 39$  (number of non-hearts in the full deck). The probability that five of the ten draws are hearts is 0.047.

You can also perform the calculation in R, using the command **dhyper(x,m,n,k)** where the arguments are as follows: x=number of successes in trials, m=number of successes in population, n=number of failures in population, and k=number of trials conducted.

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### Discussion

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