Hypergeometric Probability

Example: In a box containing 10 products, 3 of them are defective and 7 are good. If 4 are selected at random from these 10 products without replacement what is the probability that 2 of them will be defective products?

Step 1: Click through the following menu selections:

Distributions Discrete distributions Hypergeometric distribution Hypergeometric probabilities...



Step 2: The m in the dialog should be 3 and n should be 7, and the number of products selected in the random sample k would be 4. Enter these values into the dialog box as shown below and click OK. The probability distribution for this sampling will be displayed in the R Commander window.



Tail Probability (Cumulative Probability)

If one wishes to find the cumulative probability such as the probability of having 2 or less defective products, then one should choose the tail probability option.

R Commander		
File Edit Data	Statistics Graphs Models Distributions Tool	is Help
📿 Data set:	Set random number generator seed Continuous distributions	ew data set Model: Σ <no active="" model=""></no>
Binomial distribution	Discrete distributions	
Poisson distribution		
Geometric distribution		Δ.
Hypergeometric distribution 🔸	Hypergeometric quantiles	(
Negative binomial distribution 🕨	Hypergeometric tail probabilities	
	Hypergeometric probabilities	
	Plot hypergeometric distribution	
Output	Sample from hypergeometric distribution	

And, in the dialog box enter value 2 in the variable value(s) box to specify the event and check Lower tail bullet since the probability $P(X \le 2)$ is to be calculated. The rest of boxes would be the same as first example. And, click OK.

R Hypergeometric Probabilities	×		
Variable value(s)	2		
m (number of white balls in the urn)	3		
n (number of black balls in the urn)	7		
k (number of balls drawn from the urn)	4		
Output Lower tail			
🔿 Upper tail			
🔞 Help 🦘 Reset 🖌 OK 🎇 Cancel 🥐 Apply			

R Output

> phyper(c(2), m=3, n=7, k=4, lower.tail=TRUE)
[1] 0.96666667

So, the answer would be 0.9666667.