Combinatorics

Combinatorics concerns itself with how to count things. Consider a problem such as the following: What is the chance that you draw a heart from deck after you have already drawn 4 hearts? Since 4 hearts have been drawn already, that means that there are 9 remaining in the deck. There is also now only 48 cards in the deck since 4 have been removed. Therefore the probability of drawing a heart is $\frac{9}{48} = 18.75\%$.