

1. How many ways can you arrange the letters in  
PHILADELPHIA PENNSYLVANIA  
so that no two vowels are next to each other?
2. a) How many ways can you distribute 9 different letters to 6 mail-boxes?  
b) How many ways can you distribute 9 identical flyers to 6 mail-boxes?
3. A poker-like game has 9-card hands. What is the probability you get three cards of at least two kinds, and no more than three of any kind?
4. A committee consists of 7 Democrats and 8 Republicans. You select a 5-member subcommittee at random.  
a) What is the probability you get more Republicans than Democrats?  
b) What is the probability you get more Republicans than Democrats if you know you have at least 1 Republican?
5. A marksman gets bullseyes on 80% of his shots.  
a) What is the probability he gets at least 14 bullseyes in 17 shots?  
b) Suppose he shoots until he gets 14 bullseyes. What is the probability it takes him at most 17 shots?
6. Urn A has 8 red balls and 2 green balls. Urn B has 3 red balls and 7 green balls.  
Flip a coin twice. If you get two heads, draw from Urn A. Otherwise, draw from Urn B.  
a) If the ball is red, what is the probability it came from Urn A?  
b) If the ball is red, what is the probability you get another red ball if you draw without replacement from the same urn?