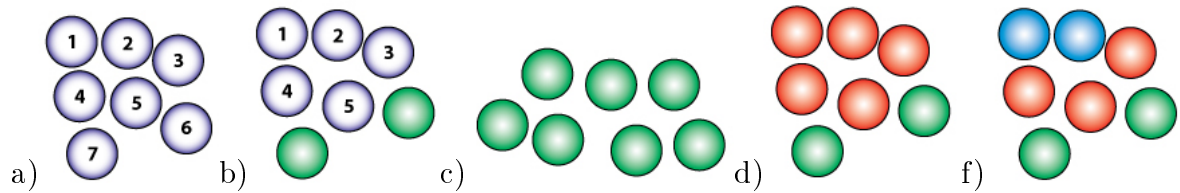
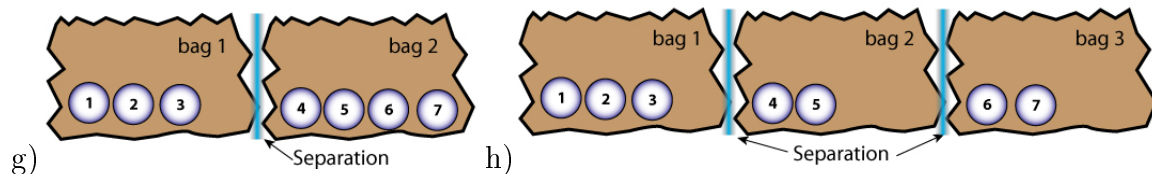


1.

Chapter 12, Probability Exercises



- a) You have 7 marbles, each with a number written on it: 1, 2, 3, 4, 5, 6, and 7 (see figure). You put these marbles into a bag and shake them up. Pulling out the marbles one by one and lining them up in a row, how many different rows of marbles can you have?
- b) You have 2 identical green marbles and 5 numbered marbles. Pulling out the marbles one by one and lining them up in a row, how many different rows of marbles can you have?
- c) You have 7 marbles, all of the same color, with no numbers to distinguish them. Pulling out the marbles one by one and lining them up in a row, how many different rows of marbles can you have?
- d) You have 2 identical green marbles and 5 identical red marbles. Pulling out the marbles one by one and lining them up in a row, how many different rows of marbles can you have?
- e) A certain minor league baseball team must win 6 out of 8 games in a season to go to the playoffs. How many ways are there to win exactly 6 out of 8 games?
- f) You have 2 identical green marbles, 2 identical blue marbles, and 3 identical red marbles. Pulling out the marbles one by one and lining them up in a row, how many different rows of marbles can you have?



- g) You have 7 marbles, each with a number written on it: 1, 2, 3, 4, 5, 6, and 7. You take these marbles and randomly place them into 2 bags in a certain order, with any number of marbles in either bag. How many different arrangements are possible?
- h) You have 7 marbles, each with a number written on it: 1, 2, 3, 4, 5, 6, and 7. You take these marbles and randomly place them into 3 bags in a certain order, with any number of marbles in each bag. How many different arrangements are possible?
- i) You have 7 identical green marbles. You take these marbles and randomly place them into 3 bags in a certain order, with any number of marbles in each bag. How many different arrangements are possible?
- j) You have q identical green marbles. You take these marbles and randomly place them into N bags in a certain order, with any number of marbles in either bag. How many different arrangements are possible?
- k) How is this similar to quanta in oscillators?

2.

A ball of mass m and radius r rolls (without slipping) down an incline of angle θ . Calculate the linear acceleration of the ball (relative to the slope).