

Chapter 3 Extra Examples (Fall 2017)

1. At a party with 12 people, each person shakes hands with everyone else exactly once. How many handshakes have occurred?
2. 4 married couples (8 people total) attend a theater event, and are to sit in a row. In how many ways can they sit if each person must sit next to their own spouse?
3. A group consists of 11 boys and 12 girls. In how many ways can a team of exactly 4 boys and 4 girls be selected?
4. In a survey of 100 college students, 60 said they enjoy football, 30 said they enjoy playing soccer, and 20 said they did not enjoy either. How many of the students enjoyed both?
5. How many three-digit **even** numbers can be formed using digits from the set $\{1, 2, 3, 4, 5, 6, 7, 8\}$ if no digit can be repeated in any one number?
6. How many five digit codes can be formed if the first two digits must be non-repeated letters of the alphabet, and the last three digits can be repeated numbers from the set $\{2,3,5,6,7,8\}$?
7. A fair coin is tossed 4 times and the result (heads or tails) is noted on each flip. How many outcomes are in the sample space for this experiment?
8. Five cards are drawn from a standard deck of 52 cards. How many hands of five cards have at least one red card?
9. How many different committees of three can be formed from 12 tennis players and 13 soccer players if at least one tennis player and at least one soccer player must be on the committee?
10. A 10 member team with 2 coaches will stand in a single row for a team picture. In how many ways can the 12 people be arranged in a row for the picture if the coaches will stand next to each other on either end of the row?
11. A college student is planning a trip to Europe. She will visit Spain, France, England, Ireland, Italy, and Germany. Due to travel constraints, she must visit France and Spain one immediately after the other, in either order. How many different itineraries can she plan?
12. A certain test has 15 multiple choice questions with 5 choices each, followed by 25 true/false questions. An answer sheet consists of one answer to each question. In how many different ways could you fill in the answer sheet?
13. Given a set with 6 elements, how many different subsets containing exactly 5 elements can be formed?
14. In how many ways can 6 people sit around a circular table with 6 seats?

15. A school play has five major parts (3 for girls and 2 for boys). 10 girls and 6 boys try out for the parts. In how many different ways can the director select the cast of five? Note that the roles in the play are all different.
16. Five cards are drawn from a standard deck of 52 cards. How many hands of five cards:
- have exactly 2 spades?
 - have same suits?
 - have same color?
 - have more than one color
17. How many three letter sorority names can be formed from the 24 letter Greek alphabet if repeated letters ARE allowed?
18. How many distinguishable arrangements can be formed using all of the letters in the word IUPUI?
19. A gym class contains 5 boys and 3 girls. How many ways can a team of 3 be selected with two of the three players designated as captain and alternate captain?
20. Five projects to be awarded to 3 different firms. In how many different ways can this be done if there are no restrictions (one firm can be awarded multiple contracts)
21. Jerry has a drawer full of brown and white socks. He randomly selects one sock at a time and notes the sequence of colors. He stops when he has a matching pair of socks. The sample space contains all possible sequences of color selections. How many outcomes are in this sample space?