

## 1.16 Essential counting practices (part 10)

1. A compact disc player is loaded with 7 CDs. The CD player is then programmed to play the CDs in random order. What is the number of different ways that the compact discs can be ordered?
2. Determine the number of lattice points enclosed by the graphs of  $|2x| = 9$  and  $|3y| = 20$ .
3. Factor 2000 as the product of primes. Use this factorization to help you find the number of positive integer factors of 2000. (Note that each factor of 2000 can be written in the form of  $2^a \cdot 5^b$  for some integers  $a$  and  $b$ .)
4. John has eight T-shirts and six pairs of shorts. He is packing for a three day trip so he needs to pack three of each. How many combinations of clothing can he pack?
5. The C & P basketball team has 10 players, 3 of which are all-stars. How many 5 player starting lineups can be chosen that include exactly 2 of the all-stars?

## 1.21 Essential counting practices (part 13)

1. How many factors does 48000 have? Among these factors, how many are
  - (a) odd numbers?
  - (b) even numbers?
  - (c) perfect squares?
  - (d) perfect cubes?
2. How many different triangles can be formed using three vertices of a hexagon as vertices of a triangle?
3. What is the sum of the numbers less than 200 that have exactly 9 divisors?
4. A committee is to be made up from a group of 10 candidates. The committee must consist of a chairman and some (not necessarily nonzero) number of members-at-large. How many ways can the committee be chosen?
5. What is the largest five-digit integer whose digits have a product equal to 5!? How many five-digit integer whose digits have a product equal to 5!?