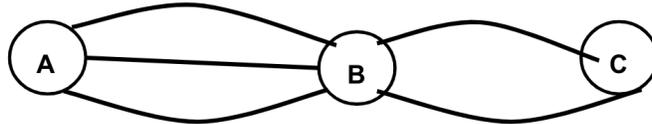
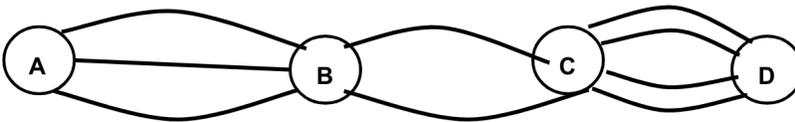


Combinatorics 1

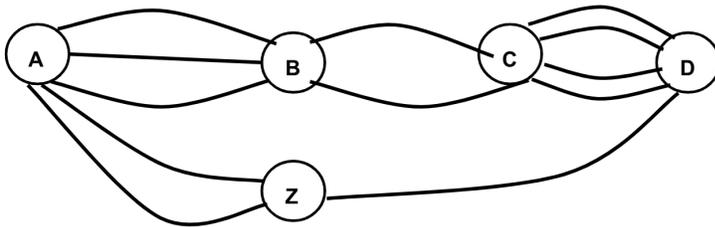
1. There are three towns in Wonderland, labeled A, B, and C in the figure. Three roads connect A and B, and two roads connect B and C. How many different routes can one take from A to C?



2. A new town, D, was built in Wonderland, and 4 roads were opened leading from C to D. How many different routes can one take from A to D?



3. A new town (Z) was founded in Wonderland, and several more roads were built. How many routes from A to D?



4. There are three different teacups and two different teaspoons available in the Wonderland Tea Shop. In how many ways can we assemble a set that contains a teacup and a teaspoon?
5. There are three different teacups, two different teaspoons, and four varieties of tea in the Wonderland Tea Shop. In how many ways can we assemble a gift set that consists of a cup, teaspoon, and package of tea.

6. Bella has a big bag of black marbles and a big bag of white marbles. How many different black and white patterns can she make by placing four of these marbles in a row?
  
7. For his summer camp, Mike packed two pairs of shoes, two pairs of shorts, and six T-shirts. In how many ways can he choose an outfit for a day at the camp?
  
8. For her summer camp, Alice packed four pairs of shoes, two skirts, five blouses, and three dresses. How many outfits can she choose? (An outfit has either a skirt + blouse + shoes OR dress + shoes)
  
9. Bella and her mom are buying a birthday gift for Max at a toy store. The store has 3 types of knight figurines, 3 types of horses, 2 types of pirate figurines, and 1 type of toy boat. Bella is allowed to choose either a knight and a horse, or a pirate and a boat. In how many ways can Bella choose Max's gift?
  
10. Malia is at the ice-cream café. The café offers 4 types of milkshakes, 10 varieties of ice cream, and 3 types of waffle cones. Malia can buy either a shake or an ice cream cone. In how many ways can she choose her treat?