

## Counting Methods #1

1. A student has a red tie and a green tie. He has a white shirt, a blue shirt, and a yellow shirt. Draw a tree diagram that shows all possible ways a tie and shirt can be selected.
2. Draw a tree diagram showing all sequences of heads and tails in two tosses of a coin.
3. A grocery store has five brands of crackers and nine different varieties of cheeses. How many different combinations of one brand of cheese and one brand of crackers can a shopper buy?
4. A house has 4 doors and 18 windows. In how many ways can a burglar pass through the house if he enters by a window and leaves by a door?
5. A cafeteria has a selection of four meats and seven vegetables. How many different selections of one meat and one vegetable are possible?
6. In how many different ways can a player select a diamond and a club from a deck of 52 bridge cards?
7. A car manufacturer provides six exterior colors, five interior colors, and three different trims. How many different color-trim schemes are available?
8. A quiz consists of six multiple-choice questions with four possible responses to each one. How many different ways can the quiz be answered?
9. How many different Social Security numbers are possible? (A Social Security number consists of 9 digits that can be repeated)
10. How many different student ID numbers are possible at CAC? A student ID number begins with 880 followed by 6 other digits that can be repeated.
11. Each parent has two genes for a given trait. A child will inherit one gene from each parent. Draw a tree diagram to show the possibilities for a child if one parent has AA and the other has Aa.
12. A serial number on a dollar bill consists of a letter followed by eight digits and then a letter. How many different serial numbers are possible, given the following conditions?
  - a. Letters and digits cannot be repeated.
  - b. Letters and digits can be repeated.
  - c. The first and last letters are repeatable vowels and the digits can be repeated.