

Things to Think on Week 3

1. There are 10 types of postcards in a post office. How many ways are there to buy
 - a) 12 postcards.
 - b) 8 postcards.
2. A train with m passengers must make n stops.
 - a) How many ways are there for passengers to get off the train at the stops?
 - b) Answer the same question if we take into account only the *number* of passengers that get off at each stop.
3. In a purse, there are 20 pennies, 20 nickels, and 20 dimes. How many ways are there to make change for a dollar?
4. A $10 \times 10 \times 10$ cube is formed of small unit cubes. A grasshopper sits in the center O of one of the corner cubes. At a given moment it can jump to the center of the face of any neighboring cube as long as the grasshoppers distance to O increases. How many ways are there for the grasshopper to reach the unit cube at the opposite corner?
5. Find the sum of all three-digit numbers that written using the digits 1, 2, 3, 4 (repetitions allowed).