Things to Think on Week 1

1. Warm up:

    a. Each box in a 2×2 table can be colored black or white. How many different colorings are possible?

    b. A soccer team consists of eleven players. How many ways are there to choose a captain and a goalie? The goalie and the captain cannot be the same person.

    c. The country of Hermetia has an alphabet that consists of three letters: A, B, and C. A word in the Hermetian language is *any* combination of no more than 4 letters. How many different Hermetian words are there?

2. Define a *word* as a combination of letters.

    a. How many different words can you get by re-arranging the letters of the word VECTOR?

    b. What about the word MATHEMATICAL?

3. Define a *necklace* as a circular string with several beads on it. It is allowed to rotate a necklace but not to turn it over. How many different necklaces can be made using 13 different beads?

4. A *super-even* number is a number whose sum of digits is even. How many nine-digit super-even numbers are there? How many n-digit super-even numbers are there?