

# Lectures on Challenging Mathematics

## Math Challenges 2

### Counting

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Internal Use

## 1.5 Essential counting practices (part 5)

1. Evaluate

$$({}_6C_3) \cdot ({}_9C_3) \cdot ({}_{12}C_3) \cdot ({}_{15}C_3).$$

(Use the fact that  $1001 = 7 \cdot 11 \cdot 13$ ).

2. A committee of four students needs to be chosen to organize the school dance. One student will be in charge of decorations, one will be in charge of the entertainment, one will be in charge of food, and the last will be in charge of advertising. If there are 10 students willing to do any of these jobs, how many different ways could four students be chosen?
3. A group of four students needs to be chosen for a field trip. If there are 10 students willing to go, how many different ways could four students be chosen?
4. There are 30 desks in a classroom. Ten students walk into the class and are allowed to choose their own seats. Every time they sit though, someone decides they do not like their seat and some or all the students switch seats making a new seating chart. If it takes only 1 second for each new seating arrangement, how long would it take for the 10 students to try every possible seating arrangement?
5. Six boys and five girls want to play on a basketball team, but there are only 5 spots. How many ways can 2 boys be picked, then 2 girls be picked, and then the last spot be filled by any of the remaining players?