End of Quarter Game: Combinatorics

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(1 point) A cafeteria offers 3 types of sandwiches, 2 types of drinks, and 4 types of fruit. A "lunch combo" consists of one sandwich, one drink, and one fruit. How many different lunch combos can you make?

(A) 9 (B) 8 (C) 24 (D) 12 (E) 32

(2 points) How many words can you make by rearranging the letters in the word "BALLOON"?

(A) 1260 (B) 180 (C) 5040 (D) 360 (E) 2520

(3 points) If n is an even positive integer, the double factorial notation $n!!$ represents the product of all the even integers from 2 to n. For example, $8!! = 2 \cdot 4 \cdot 6 \cdot 8$. What is the units digit of the following sum?

$$2!! + 4!! + 6!! + ... + 2024!! + 2026!!$$

(A) 0 (B) 2 (C) 4 (D) 6 (E) 8

(4 points) Greedy Gabriel is distributing 13 candies among himself and his friends, Alice and Bob. Gabriel will make sure that he has the most candies out of the three, but will also make sure that both Alice and Bob get at least 1 candy. How many ways are there for him to distribute the candies?

(A) 24 (B) 26 (C) 16 (D) 18 (E) 22

(5 points) WackDonald's serves chicken nuggets in servings of 6, 7, and 9 nuggets. k is the largest number of chicken nuggets that you can't get from WackDonald's. What is the sum of the digits of k?

(A) 8 (B) 11 (C) 12 (D) 4 (E) 7

(6 points) How many distinct planes contain at least 3 corners of the unit cube?

(A) 18 (B) 12 (C) 20 (D) 24 (E) 16

(7 points) A group of people is called "supersocial" if any two people picked from the group are friends. A group of people is called "antisocial" if no two of them are friends with each other. Andrew is hosting a party. How many people must be at the party to guarantee that there will be a supersocial group of three people or an antisocial group of three people?

(A) 4 (B) 5 (C) 7 (D) 6 (E) 10