Problem set 2, assigned on 9/29/19

1. The Sunny Hill Middle School girls gymnastics team has 20 students, with Jill and Mary being the only 7th graders. How many different ways are there to choose 8 girls to participate in a meet if at least one of the 7th graders has to be included?

2. Someone chose 10 points on a plane such that no 3 points are on the same line. How many triangles with vertices in these points are there?

3. Seven nouns, five verbs, and two adjectives are written on a black- board. We can form a sentence by choosing one word of each type, and we do not care about how much sense the sentence makes. How many ways are there to do this?

4. How many ways are there to choose four cards of different suits and different values from a deck of 52 cards?

5. We toss a die three times. Among all possible outcomes, how many have at least one occurrence of six?

6.* How many nine-digit numbers have an even sum of their digits?