COMBINATION II

MATH CIRCLE (INTERMEDIATE) 5/13/2012

1) A father has 2 apples and 3 pears. Each weekday (Monday through Friday) he gives one of the fruits to his daughter. In how many ways can this be done?

2) Ten points are marked on a plane so that no three of them are on the straight line. How many triangles are there with vertices at these points?

3) Ten points are marked on a straight line, and 11 points are marked on another line, parallel to the first one. How many

a) triangles;

b) quadrilaterals

are there with vertices at these points?

4) In how many ways can you choose 10 cards from a deck of 52 cards so that

a) there is exactly one ace among the chosen cards?

b) there is at least one ace among the chosen cards?

5) How many six-digits numbers have 3 even and 3 odd digits?

Challenge 1) Find the sum of all three-digit numbers that can be written using the digits 1, 2, 3, 4 (repetitions allowed).

Problems are taken from:

- D. Fomin, S. Genkin, I. Itenberg "Mathematical Circles (Russian Experience)"
- Previous UCLA Math Circle notes

Warm up 1) In how many ways can one choose 4 colors out of 7 given colors?

Warm up 2) There are 2 girls and 7 boys in a chess club. A team of four persons must be chosen for a tournament, and there must be at least 1 girl on the team. In how many ways can this be done?