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Problem 1 From a deck of playing cards, four *threes*, four *fours* and four *fives* are selected and put down on a table with the main side up. Players A and B alternately take the cards one by one and put them on the pile. Player A begins. A player after whose move the sum of values of the cards on the pile is
(a) greater than 34;
(b) greater than 37;
loses the game. Which player has a winning strategy?

Problem 2 In a convex quadrilateral $ABCD$, the diagonal AC intersects the diagonal BD at its midpoint S. The radii of incircles of triangles ABS, BCS, CDS, DAS are r_1, r_2, r_3, r_4, respectively. Prove that

$$|r_1 - r_2 + r_3 - r_4| \le \frac{1}{8}|AB - BC + CD - DA|.$$

Problem 3 Prove that there are no positive integers n and $k \le n$ such that the numbers

$$\binom{n}{k}, \binom{n}{k+1}, \binom{n}{k+2}, \binom{n}{k+3}$$

in this order form an arithmetic progression.
