

Croatia Team Selection Test 2003

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by parmenides51

- 1 Find all pairs (m, n) of natural numbers for which the numbers $m^2 - 4n$ and $n^2 - 4m$ are both perfect squares.

- 2 Let B be a point on a circle k_1 , $A \neq B$ be a point on the tangent to the circle at B , and C a point not lying on k_1 for which the segment AC meets k_1 at two distinct points. Circle k_2 is tangent to line AC at C and to k_1 at point D , and does not lie in the same half-plane as B . Prove that the circumcenter of triangle BCD lies on the circumcircle of $\triangle ABC$.

- 3 For which $n \in \mathbb{N}$ is it possible to arrange a tennis tournament for doubles with n players such that each player has every other player as an opponent exactly once?
