

1096-VC-696

**Ellina Grigorieva\*** (egrigorieva@twu.edu), PO BOX 425262, Denton, TX 76204. *Methods of solving complex problems: history of mathematics approach.*

Problems solved by ancient mathematicians very challenging and their different versions appear on some exams and math contests. This presentation will emphasize important and sometimes overlooked topics on triangles, quadrilaterals and circles such as Menelaus-Ceva theorems or Simson line, along with their proofs. You will be able to dissect a segment in the Golden ratio, construct an angle of 36 degree and visualize Fibonacci number. We will prove the inequality between geometric, arithmetic and harmonic means in pure geometric way, the way it was done 1000 years ago by ancient Greeks and prove why not every angle can be trisected using modern methods. You will learn which quadrilateral with given diagonals has the maximum area and solve unusual problems involving cyclic quadrilaterals and problems on location of circles and polygons with respect to each other. Moreover, it will be demonstrated how methods and “tricks” from elementary mathematics can be used in solving “hard” problems of undergraduate and graduate mathematics, such as differential equations, analysis and number theory. (Received September 09, 2013)