

Meeting: 1003, Atlanta, Georgia, MAA CP R1, MAA Session on My Three Favorite Original Calculus Problems

1003-R1-1095 **Ralf G. Peters*** (ralf@unbc.ca), Mathematics Program, University of Northern British Columbia, 3333 University Way, Prince George, B.C. V2N 4Z9, Canada. *Three Problems for the Analytic Geometry Component of a First-Year Calculus Course.*

These days, analytic geometry is often relegated to bits of algebra or calculus courses. However, analytic geometry is more than conic sections; it is also useful in problem solving. The first problem, presented here, asks students to find the equation of a triangle. This problem appeared on a precalculus test, but it can also be used during an algebra review in a calculus course. The second problem asks for the radius of a circle that: (i) is concentric with a given circle, and (ii) just touches, but does not cross, a given line. This is a variant of a well-known problem, that of finding the distance from a point to a line. One of the many solutions adopts a first-year calculus approach which, however, demands that the students "think geometry" before they can successfully apply the calculus. The third problem asks students to find the one member of a family of ellipses that just touches, but does not cross, a given line. A calculus solution is possible. But the most elegant solution is strictly algebraic; it employs the fact that the given system of equations has only one (not two) solutions. Calculus and analytic geometry are both aids in problem solving. (Received October 03, 2004)