



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Caroline Suen	Project Number S1221
Project Title Triangular Discoveries: A Look into Heron's Formula and Beyond	
Abstract Objectives/Goals This project aims to find properties other than those involving matrices and determinants to prove Heron's Formula and Brahmagupta's Formulas. Methods/Materials Various strategies were used to do so: plotting triangles with their circumcenters at the origin, plotting triangles with their vertices on the two axes, simply drawing triangles on a plane, and expanding Heron's and Brahmagupta's formulas. Results A comparison between my new proofs and the official proofs of the Formulas shows that the concepts used in my proofs were more accessible, thus proving my hypothesis correct. Additionally, the discovered properties provided algebraical insights into understanding the concepts underlying Heron's Formula. Conclusions/Discussion These properties can be used in mathematical drills, contests, research, and other related areas. Additionally, the similarity of the proofs for Heron's Formula, Brahmagupta's Formula, and its extension might be implemented to develop a formula for a polygon with greater than four sides, and perhaps eventually a general formula for any n-gon!	
Summary Statement This project finds properties other than those involving matrices and determinants to prove Heron's Formula and Brahmagupta's Formulas.	
Help Received Biology teacher submitted project application; Mother bought materials.	