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Using Computer Graphing Software as an Aid in Teaching Maxima-Minima Problems

At the United States Merchant Marine Academy, the syllabus for all sections of calculus includes five one-hour computer-lab sessions per quarter. This time is devoted to using pre-packaged software for problem-solving and to increase students' understanding of the theory of calculus.

The speaker will present several examples of how a computer graphing program can be used to solve maxima-minima verbal problems that otherwise would be too time-consuming to present in class. Problems encountered in using the software will be discussed.

Examples will include minimizing the distance from a point to a curve and maximizing the volume of a box created from a rectangular sheet of cardboard. It will be shown how using a graphing routine obviates the need for the instructor to hand-pick the values for these types of problems.

Difficulties in choosing the "viewing rectangle" (that is, the range of values of the independent and dependent variables) for the desired graphs are well-documented ([1], [2, p. 240]). The speaker will discuss several ways in which the student can efficiently determine suitable regions.

References

1. Franklin Demana and Bert K. Waits, "Pitfalls in Graphical Computation, or Why a Single Graph Isn't Enough," *The College Mathematics Journal* 19 (March, 1988) 177-183.
2. Bert K. Waits and Franklin Demana, "Problem Solving Using Microcomputers," *The College Mathematics Journal* 18 (May, 1987) 236-241.