

1046-Z1-236

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Illustrating Algorithms for Computing Computer Graphics. Preliminary report.

This talk is applicable to all classes and students who use calculators and computers for computation and graphics. Our objective is to use computer graphics to show how mathematics is used to power the machines that students use every day.

We shall look at calculating elementary functions using methods such as table-lookup algorithms and minimax polynomials for the purposes of graphing on computers. As computers depend on pixels for graphing, algorithms only need do enough calculations to be accurate to within a pixel-which sets the accuracy required by the algorithms. The number of calculations needed for computing the sine, cosine, and tangent functions to the degree of accuracy required for graphing will be computed and illustrated. The same results will be used to compute sine and cosine values for rotation matrices in R2 and R3 using a minimal number of computations to get accurate rotational results.

The algorithms and graphics will be illustrated using Flash CS3. (Received August 21, 2008)