1067-Z1-1143          **Gerald M. Higdon\*** (`ghigdon@fitchburgstate.edu`), Department of Mathematics, Fitchburg
State University, Pearl St., Fitchburg, MA 01420. *Rectangular to Polar*
*Transformations.* Preliminary report.

When transforming from polar to rectangular coordinates the transforming functions are well known and easy to apply. In the reverse transformation the problem is more subtle for the polar angle. Most texts gloss over this problem indicating that $\tan\theta = \frac{y}{x}$ "solves the problem" and then add some remarks about adjusting the solution to this equation for various quadrants. This talk will present several closed form functional representations of $\theta$ as a function of $x$ and $y$. Properties of these functions and relationships between them will be discussed as well as deriving techniques and suggestions for classroom usage. (Received September 21, 2010)