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Edward W. Swim*, Department of Mathematics and Statistics, Box 2206, Huntsville, TX 77341, and **Stephen M. Scariano**, Department of Mathematics and Statistics, Box 2206, Huntsville, TX 77341. *Piecewise Polynomial Approximations to the Standard Normal Cumulative Distribution Function.*

Many efforts have been made to approximate the standard normal distribution, using a form that is simpler in some sense than the integral definition of the normal cumulative distribution function (CDF), for both numerical and educational purposes. Many of these approximations suffer from inaccuracy in common intervals of interest and/or include functions that require an understanding of transcendental functions to calculate the probability density function. Piecewise polynomial interpolation provides an effective method for approximation that may somewhat retain the shape of the CDF and yet require only a basic understanding of polynomials for further analysis. Here we present piecewise polynomial approximations to the standard normal CDF with a closed form representation that is easily manipulated by undergraduate students who lack significant exposure to calculus. Simultaneously, our approximations provide a high degree of accuracy on even the widest intervals of common use in most areas of application. (Received September 15, 2014)