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Approximations to the Normal Distribution Function and An Extended Table for the Mean Range of the Normal Variables

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Abstract. This article presents a formula and a series for approximating the normal distribution function. Over the whole range of the normal variable z, the proposed formula has the greatest absolute error less than $6.5e-09$, and series has a very high accuracy. We examine the accuracy of our proposed formula and series for various values of z's. In the sense of accuracy, our formula and series are superior to other formulae and series available in the literature. Based on the proposed formula an extended table for the mean range of the normal variables is established.

Key words and phrases: Accuracy, error Function, normal Distribution.