

1106-VI-1411 **Zengxiang Tong*** (ztong@otterbein.edu), Department of Mathematical Sciences, Otterbein University, 1 S Grove Street, Westerville, OH 43081. *A Functional Equation and Normal Distribution*. Preliminary report.

The binomial distribution, Poisson distribution, and normal distribution are three most important distributions in probability theory. Most textbooks introduce the first two distributions in a very educational way: real life examples, mathematics models, mathematical reasoning, and the rigorous derivation of their probability mass functions. However, no textbook I have ever seen introduces the normal distribution in this way. All books simply gives the weird probability density function, which often scares students away. This paper starts from the target shooting, analyzes it, mathematically models it, and uses functional equation to derive the probability density function of normal distribution. The author strongly recommends this example to all probability professors and textbook writers in hope of enhancing the quality of probability education. (Received September 12, 2014)