

PH661 – Fall 2008
Statistical methods for physics and astrophysics
Assignment #4 – Monday, Sept 8, 2008

1. Consider a random variable Y given by the sum on N independent uniform variates X_i in $(0, 1)$,

$$Y = \sum_{i=1}^N X_i \quad (1)$$

- (a) Find the mean and the variance of each random variable X_i ;
- (b) Show that, in the limit of $N \rightarrow \infty$, Y is distributed like a Gaussian with mean $N/2$ and variance $N/12$.
- (c) (Optional) Show, via a numerical simulation, that the sum of N uniform variates is a Gaussian-distributed, as per point (b) above.