

PH689-01 – Fall 2006
Statistical methods for physics and astrophysics
Assignment #2 – Tuesday, August 29, 2006

1. Find the constant A that makes the following function a probability distribution function over the interval \mathbb{R} :

$$f(x) = A \cdot \frac{1}{1+x^2}$$

For the same random variable, find the mode and mean.

2. Find the expected value and the variance of the random variable X , which has p.d.f.

$$f(x) = \frac{1}{2}, x \in [0,2]$$

3. A coin is tossed 10 times. Find:

(a) the probability of having 5 heads and 5 tails;

(b) the probability of having the first 5 tosses show head, and the final 5 tosses show tails;

(b) the probability to have at least 7 heads.