APPLIED MATHEMATICS 02/03/2018

1) Suppose that X is a continuous random variable whose probability density function is given by

$$f_X(x) = \begin{cases} C(4x - 2x^2) \ if \ 0 < x < 2 \\ 0 \ otherwise \end{cases}, \ x \in \mathbb{R}.$$

What is the value of C? Find $\mathbb{P}(X > 1)$.

2) The probability of error in the transmission of a binary digit over a communication channel is $\frac{1}{1000}$. What is the probability of more than 3 errors when transmitting a block of 1000 bits.

3) National Safety Council data show that the number of accidental deaths due to drowning in the United States in four consecutive years were (in units of one thousand) 5.2, 4.6, 4.3, 4.8. By assuming that the number of such deaths is normally distributed, use these data to give a 95 percent confidence interval for the mean number of the deaths.