EE 381 Homework 3 Part 3

Name, I.D. #, and Date: _____

Instructions: Instructions: Attempt each exercise and show your work. You can attach pages to your submission. Submit this part of homework 3 with the additional parts of homework 3 on Monday March 2. You may want to make copies of your work.

Expectation

Let X be a random variable (RV) with either probability density function $f_X(x)$ (continuous) or probability mass function $f_X(x)$ (discrete) The *expected value* of X is denoted by $E(X)$, or μ, and is given by

$E(X) = \sum_{\text{all x}} x f_X(x)$ if X is discrete

$E(X) = \int_{-\infty}^{\infty} f_X(x)dx$ if X is continuous

Given n RV $X_1, X_2, \ldots, X_n$ and a set of n constants $a_1, a_2, \ldots, a_n$,

$E(a_1X_1 + a_2X_2 + \cdots + a_nX_n) = a_1E(X_1) + a_2E(X_2) + \cdots + a_nE(X_n)$

You have $5000.00 to invest. A bond is available and it pays a return (or simple interest) of 4% but has a default rate of 2%. If you invest your $5000.00 in this bond what is the expected rate of return?

Roll 2 standard die and add the numbers. What is the probability of getting a number larger than 9 for the first time on the third roll?

Let Z be a continuous uniform RV on $[a, b)$. Determine the variance of Z.