STAT 2501 Homework Assignment #3

From Sheldon M. Ross, do the following problems from Chapter 2 (pages 91-92):

2.43, 2.46, 2.47, 2.48, 2. 50, 2.51.

Also, I would like you to turn in the following problem:

EP1. The probability mass function for the number of machines that might break down in a day has been determined for a machine shop. Let X denote the number of breakdowns per day. The probability mass function for X is given by

$$X = \begin{cases} 0, & with\ \ probability\ 0.3 \\ 1, & with\ \ probability\ 0.6 \\ 2, & with\ \ probability\ 0.1 \end{cases}$$

(a) Explain why X is a discrete random variable.
(b) Compute $P(X = 1)$ and $P(X \le 1)$.
(c) Find $E(X)$ and $Var(X)$
(d) Daily repair costs, R (measured in dollars), are found to be $R = 300 + 1200Y$. Find $E(R)$ and $Var(R)$.

EP2. At a computer store, the annual demand for a particular software package is a discrete random variable X. The store owner orders four copies of the package at 10 dollars per copy and charges customers 35 dollars per copy. At the end of the year, the package is obsolete and the owner loses the investment on unsold copies. The probability mass function for X is given by the following table:

x	0	1	2	3	4
$f_X(x)$	0.1	0.3	0.3	0.2	0.1

(a) Find $E(X)$ and $Var(X)$

(b) Express the owner's net profit ,Y, as a linear function of X, and find $E(Y)$ and $Var(Y)$.