Name:
1. The joint distribution of random variables $X$ and $Y$ is given by the following table.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>0</td>
<td>.1</td>
<td>.1</td>
</tr>
<tr>
<td>Y</td>
<td>0</td>
<td>.5</td>
<td>.1</td>
</tr>
<tr>
<td>1</td>
<td>.2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

(a) Find $E(X)$, $E(Y)$, $Var(X)$, and $Var(Y)$.
(b) Find $E(XY)$, $Cov(X,Y)$, and $\rho(X,Y)$.
2. The joint density function of \( X_1 \) and \( X_2 \) is given by

\[
f(x_1, x_2) = \begin{cases} 
6x_2, & \text{if } 0 \leq x_2 \leq x_1 \leq 1, \\
0, & \text{otherwise}
\end{cases}
\]

(a) Find marginal pdfs of \( X_1 \) and \( X_2 \).
(b) Find the means and variances of \( X_1 \) and \( X_2 \).
(c) Find the covariance of \( X_1 \) and \( X_2 \).
(d) Find the mean and variance of \( X_1 - 2X_2 \).