

Problem Set #9

1. Denote the bivariate probability density function for X and Y by $f(x, y)$. Let $f(x, y)$ equal $x + y$ for $\{0 \leq X \leq 1\}$ and $\{0 \leq Y \leq 1\}$, zero otherwise. Find the marginal distributions for X and Y , respectively. Please denote them by $f_X(x)$ and $f_Y(y)$.
2. Using the same bivariate probability density function, find the covariance between X and Y .
3. Continuing with the same definitions of X and Y , define $W_1 = 6 + 12X + 24Y$. Find the variance of W_1 .
4. Define $W_2 = 12 + 12X - 24Y$. Find the variance of W_2 .
5. Find the covariance between W_1 and W_2 .
6. Find the correlation coefficient between W_1 and W_2 .