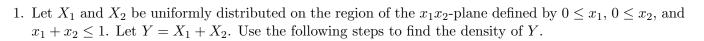
Section 4.6 Day 24



(a) Identify the possible values of Y.

(b) Sketch the graph Y = y in the x_1x_2 -plane.

(c) Find the region R in the x_1x_2 -plane where $Y \leq y$.

(d) Find the cdf $F_Y(y)$ by integrating the joint density of X_1 and X_2 over the region R.

(e) Differentiate $F_Y(y)$ to obtain the density $f_Y(y)$.

2. Let X_1 and X_2 have joint density $f(x_1, x_2) = 3x_1$, for $0 \le x_2 \le x_1 \le 1$. Let $Y = X_1 - X_2$. Find the density of Y.

3. The joint density of X_1 and X_2 is $f(x_1, x_2) = 4e^{-2(x_1+x_2)}$ for $X_1 > 0$ and $X_2 > 0$. Find the density of $Y = \frac{X_1}{X_1 + X_2}$.

4.	Suppose X	$_1$ and X_2	are iid	Unif[0, 1].	Let Y_1	$= X_1$ -	$+ X_2$	and Y_2 =	$= X_1$	$-X_{2}$

(a) Find the region of possible values of the pair (Y_1, Y_2) .

(b) Find the inverse transformation functions v_1 and v_2 such that $X_1 = v_1(Y_1, Y_2)$ and $X_2 = v_2(Y_1, Y_2)$.

(c) Use the tranformation theorem to find the joint pdf of Y_1 and Y_2 .

