Show **all** of your work on this assignment and answer each question fully in the given context.

Please staple your assignment!!

1. Chapter 5, Problem 37 (page 331 - ask if the "hint" in part d is confusing)
2. Chapter 5, Problem 33 (page 330 - this is a good example of CQ style problems)
3. Chapter 5, Problem 35 (page 330 notice that if $y \leq x$, then $f(x, y) = 0$)
4. Suppose that $Z_1, Z_2, \ldots, Z_n$ are n independent standard normal random variables. It may be helpful to recall that $E(aZ_i + b) = aE(Z_i) + b$ and that $Var(aZ_i + b) = a^2 Var(Z_i)$ for any constants a, b in addition to knowing that $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$ and $\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$.
    a. Find the expected value and variance of X where $X = 3Z_1 + 5$
    b. Find the expected value and variance of Y where $Y = Z_1 - Z_2$
    c. Find the expected value and variance of U where $U = Z_1 - Z_1$
    d. Find the expected value and variance of W where $W = \sum_{i=1}^{n} \frac{i}{n} \left(Z_i + \frac{i}{n}\right)$.