

Quiz 6

Instructions: This quiz is worth a total of 20 points with the point value of each question is listed with each question. You may use any notes or books but you must work individually. Make sure to write clearly and justify your answers.

- (1.)(6 pts.) Suppose that X and Y are jointly distributed continuous random variables with joint density $f(x, y)$.
- (a.) If $Z = X - 2Y$ then find $P(Z \leq z)$.
 - (b.) Find the density function of $Z = X - 2Y$.
- (2.)(6 pts.) Suppose that X and Y are independent random variables which are uniformly distributed on $(0, 1)$.
- (a.) Find $P(X^{3/2} \leq Y)$.
 - (b.) Find $P(|2X + 3Y| \leq 0.25)$.
- (3.)(4 pts.) If X is a random variable which has a normal $(0, 1)$ distribution, find the density function of $Y = X^3 - 3x^2 + 2X$.
- (4.)(4 pts.) If X is a random variable which is exponentially distributed with parameter λ , find $P(X^2 - 5X \leq t)$.