

Additional practice (Do not require to submit in class)

1. Given  $X$  and  $Y$  are continuous random variable with the joint PDF

$$f(x, y) = \frac{3}{2} - x - \frac{1}{2}y, \quad 0 \leq x \leq 1, 0 \leq y \leq 2$$

- a. What is the probability when  $X > 0.5$  and  $0 < Y < 1$
- b. What is the marginal pdf of  $X$
- c. What is the marginal pdf of  $Y$
- d. Find the expected value of  $Y$
- e. Find the variance value of  $Y$

2. Given  $X$  and  $Y$  are random variable

- a. Prove that

$$\text{Var}(X - 2Y) = \text{Var}(X) + 4\text{Var}(Y) - 4\text{Cov}(X, Y)$$

- b. If  $X$  and  $Y$  are independent prove that

$$\text{Var}(X - 2Y) = \text{Var}(X) + 4\text{Var}(Y)$$