MA395 Takehome Quiz5

Name:

1) (Problem 3.8.6) Let Y be a random variable with

$$f_Y(y) = 6y(1-y), \quad 0 \le y \le 1$$

Show that the pdf of $W = Y^2$ is

$$f_W(w) = 3(1 - \sqrt{w})$$

2) (Problem 3.8.2) Find the pdf of X + Y if X and Y are independent random variables with

$$f_X(x) = xe^{-x}, \quad x \ge 0 \quad \text{and} \quad f_Y(y) = e^{-y}, \quad y \ge 0$$

3) (Problem 3.9.2) Suppose

$$f_{XY}(x,y) = \lambda^2 \cdot e^{-\lambda(x+y)}$$

Find E(X+Y).

4) (Problem 3.8.7) Given that X and Y are independent random variables, find the pdf of XY for the following two sets of marginal pdfs:

(a)	$f_X(x) = 1,$	$0 \le x \le 1$	and	$f_Y(y) = 1,$	$0 \le y \le 1$
(b)	$f_X(x) = 2x,$	$0 \le x \le 1$	and	$f_Y(y) = 2y,$	$0 \le y \le 1$

5) (Problem 3.9.13) Suppose

$$f_{XY}(x,y) = \lambda^2 \cdot e^{-\lambda(x+y)}$$

Find $\operatorname{Var}(X+Y)$.