

Name _____ Surname _____ Student ID. _____

DUE DATE : Tuesday 29 August 2017

Assignment 1: (30 marks)

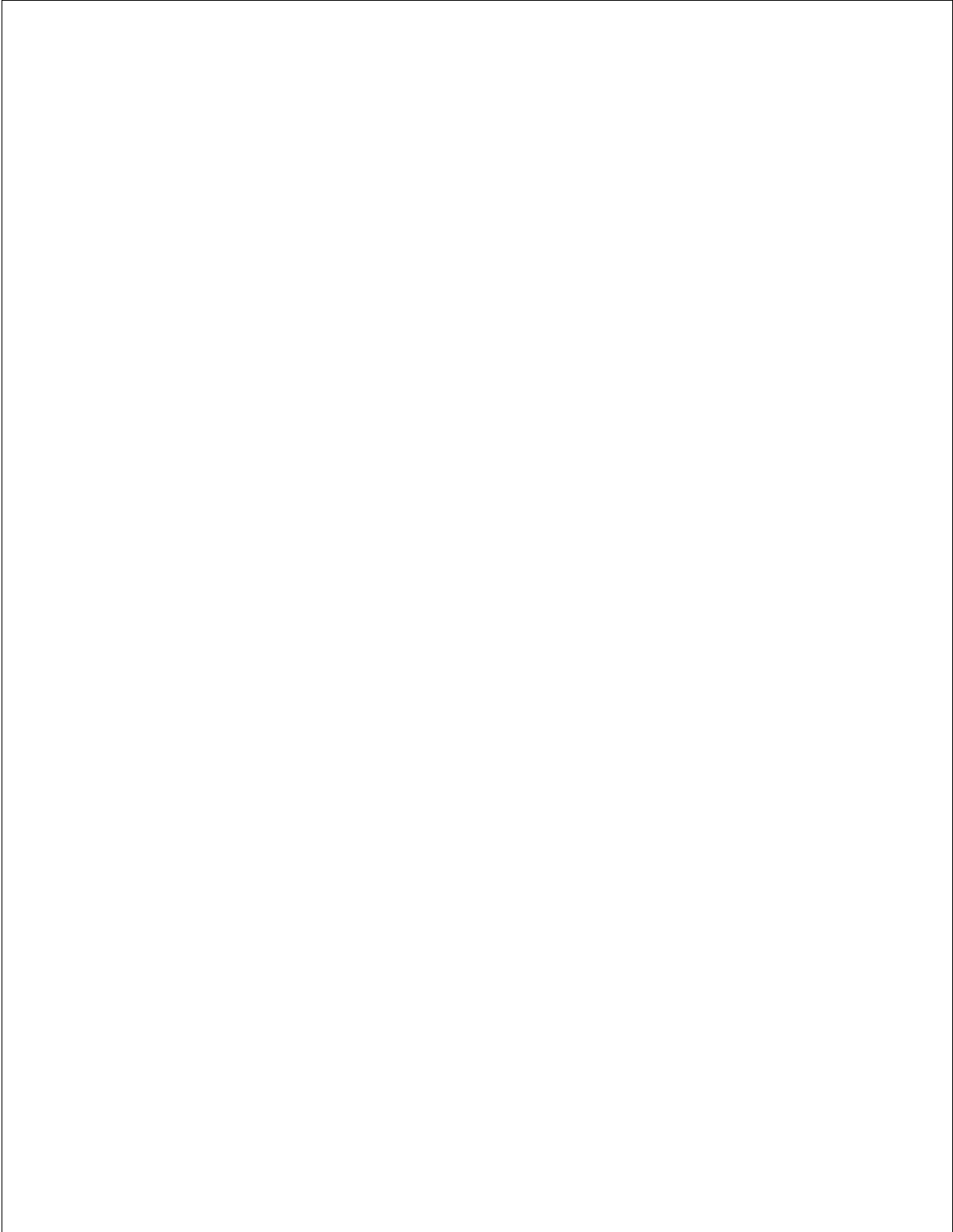
I pledge to the Honor Code and to obey all rules for taking and performing homework assignments as specified by the course instructor in the course syllabus.

Student Signature: _____

1.(10 marks) Let X and Y have the joint probability density function specified in the following table.

		X			
		1	2	3	
Y	1	0.1	0.05	0.15	$f(Y = 1)$ =
	2	0.20	0.40	0	$f(Y = 2)$ =
	3	0.05	0.05	0	$f(Y = 3)$ =
		$f(X = 1)$ =	$f(X = 2)$ =	$f(X = 3)$ =	

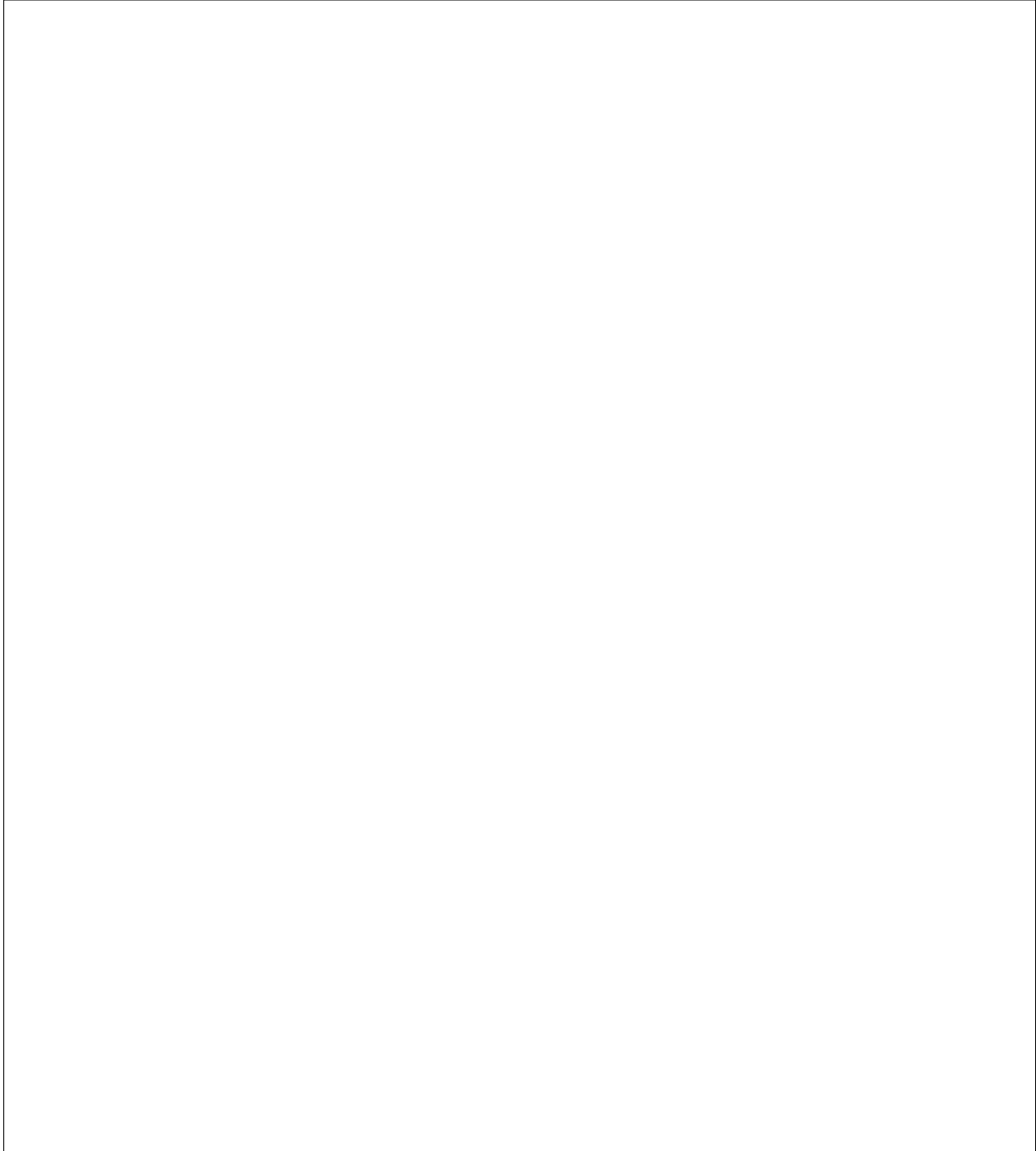
[1]. Find $E(X^3|Y = 1)$ and $var(X|Y = 3)$



2. (10 marks) Suppose the joint distribution of X and Y is such that

$$E[X] = 5 \quad E[X^2] = 30 \quad E[Y|X] = 3X \quad E[XY|X] = 3X^2 \quad \text{Var}[Y] = 81$$

Find (a) $\text{Cov}(X, Y)$ and (b) $\text{Corr}(X, Y)$



3.(10 marks) Let X and Y be random variables with the following joint distribution

$$f(x, y) = P(X = x, Y = y) = 1/8$$

If $x \in \{-1, 0, 1\}$ and $y \in \{-1, 0, 1\}$ BUT $(x, y) \neq (0, 0)$

Show that the $\text{Cov}(X, Y) = 0$ BUT X and Y ARE NOT INDEPENDENT.