

MA 222 EXAM #3**April 15, 2015**

Name: _____

I pledge my honor that I have abided by the Stevens Honor System.

signature: _____

Closed book, closed notes, no electronic access. Answer all questions.

(20 points) 1. Following is the joint probability distribution for random variables X and Y .

- Are X and Y independent variables? Explain how you arrived at your answer.
- Find the probability distribution for the random variable Z , where $Z = X + Y$.

$X \backslash Y$		
	0	1
6	$\frac{1}{8}$	$\frac{1}{4}$
9	$\frac{1}{4}$	$\frac{1}{4}$
12	0	$\frac{1}{8}$

(20 points) 2. You play a game 100 times in which at each play of the game you have a .6 chance of losing \$3 and a .4 chance of gaining \$4. What is your expected net gain over the 100 plays of this game?

(20 points) 3. If the percentage of people who wear eyeglasses is 30%, what is the probability that in a random sample of 100 people, more than 35% of them are wearing eyeglasses?

(20 points) 4. The weights of adult males in a certain population average 160 pounds with a standard deviation of 20 pounds. A random sample of 35 males is selected, and the weight of each male is noted.

What is the probability that the average weight of the males in the sample is less than 150 pounds?

(20 points) 5. Suppose the random variables X and Y have the joint probability density function

$$f(x,y) = \frac{1}{3} x^3 y \quad \text{for } 0 \leq x \leq 2 \text{ and } 0 \leq y \leq 1$$

- a) Find $P(X < 1)$ b) Find $E(X^3)$