1) (15 points) You are shown 3 tiles. Tile $A$ is red on both sides. Tile $B$ is black on both sides. Tile $C$ is red on one side and black on the other. The three tiles are put in a bag and you randomly select a tile.

a) (3 points) What is the probability you selected tile $C$?

b) (12 points) What is the probability you selected tile $C$ given that one side of the tile you selected is red?
2) (20 points) In Russellville, 20% of the voters are republicans, 30% are democrats, and the rest independents. Assume that 80% of democrats favor Obamacare, 30% of republicans favor Obamacare, and 40% of independents favor Obamacare.

a) What is the probability a randomly selected person from Russellville favors Obamacare?

b) What is the probability a randomly selected person is a Democrat who does not favor Obamacare?
c) If randomly selected person is in favor of Obamacare, what is probability this person is a Republican?

d) If randomly selected person is in favor of Obamacare, what is probability this person is a Republican or Democrat?
3) (10 points) Consider the following scenario:

• 3 Texan men
• 1 Californian man
• 6 Texan women
• $n$ Californian women

a) (5 points) Suppose $n = 10$. If a person is to be selected at random, are sex and location independent? Justify your answer.

b) (5 points) What must $n$ equal for sex and location to be independent?
4) (20 points) You are given a fair 4-sided die. The four sides read ‘1’, ‘1’, ‘2’, and ‘8.’ Let $X$ be
value shown after a roll.

a) Find $P\{X = 1\}$.

b) Find $E[X]$.

c) Find $Var(X)$.

d) Find $SD(X)$.
5) (10 points) Russell, your not so bright friend, tells you $F(a)$ is the distribution function for a random variable $X$. Furthermore he tells you $F(0) = .6$, $F(1) = .8$, $F(2) = .7$, and $F(3) = 1$. Why is Russell wrong?

6) (10 points) Let $Y$ represent the sum of two dice. Compute $P\{Y \geq 10\}$
7) (20 points) For a certain game, a single fair 6-sided die is rolled until either a 2 is rolled or there have been three rolls. Let $X$ be the number of rolls that occurred during a game. Determine the probability mass function of $X$. 