Name: _____ **MAT 221**
Fall 2014 **Problem Set 4**

Problem 1: Mark the following T (true) or F (false):

(a) _____: One need only record a few trials to be able to create a chart of probabilities and make accurate predictions.

(b) _____: Random phenomenon are outcomes that one cannot use probability arguments to predict possible outcomes.

(c) _____: Independent trials are events where one outcome does not influence any of the others.

(d) _____: All probabilities are between 0 and 1.

(e) _____: Disjoint events are independent.

Problem 2: Krystina likes to cheat at dice games so she always brings a weighted dice. Her foul dice has the following probabilities:

Value	1	2	3	4	5	6
Probability	0.10	0.25	0.20		0.15	0.25

(a) Complete the table above, i.e. find the probability of rolling a 4.

(b) What is the probability of rolling a 1 or a 5, i.e. what is $P(1 \text{ or } 5)$?

(c) What is the probability of rolling a 2 or a 6, i.e. what is $P(2 \text{ or } 6)$?

(d) What is the probability of *not* rolling a 3, i.e. what is $P(\text{not } 3)$?

(e) What is the probability of rolling a 7? What about the probability of rolling a 2 *and* a 3?

(f) The probability of the sum of two rolls being 10?

Problem 3: Given that A and B are independent events with $P(A) = 0.7$ and $P(B) = 0.4$, find the following:

(a) $P(A \text{ and } B)$

(b) $P(B \mid A)$

(c) $P(A \text{ or } B)$

Problem 4: There are three airlines to get from Mayberry to Pawnee: Artin Lines, Stewart Air, or Albowitz Flights. If you take Artin, there is a 60% chance your flight will be late, 50% if you take Stewart, and a 20% chance that you will be late if you take Albowitz. However, Artin services 50% of the flights from Mayberry to Pawnee, Stewart handles 40% of the flights, while Albowitz handles only 10% of the flights.

(a) Draw a diagram illustrating the possible outcomes.

(b) What is the probability that you took a flight from Mayberry to Pawnee and were late? What is the probability that you were both late and took Albowitz?

(c) If you took a flight from Pawnee to Mayberry and the flight was on time, what was the probability that it was Stewart?

Problem 5: Real estate ads suggest that 64% of homes for sale have garages, 21% have swimming pools, and 17% have both features.

(a) Find the probability that a home for sale has a garage or a swimming pool.

(b) Find the probability that it has neither a swimming pool nor a garage.

(c) Find the probability that a randomly chosen home has a pool but not a garage.

(d) If a randomly chosen house has a garage, what is the probability that it also has a pool?