**MGT 2250 TSA**

**Homework 1**

**August 24, 2012**

1. When you roll a 6-sided die, what is the probability of obtaining a 3? Is rolling a 3 considered an elementary event? Why?
2. When you roll two six-sided dice, what is the probability of obtaining a 10? Is rolling a 10 considered an elementary event? Why?
3. If you flip a coin and roll a six-sided die, what is the probability that you will flip a heads and roll a 4? Assume that the flip and roll are independent.
4. The probability of event A is 46%. The probability of event B is 37%. p(A∩B) = 24%. Calculate p(AUB).
5. If you flip a coin twice, what is the probability that you will flip one heads and one tails (in any order)?
6. In a standard deck of cards, you remove the king of spades and the king of clubs (leaving 50 remaining cards). You randomly select three cards without replacement. What is the probability that at least one of the three cards you selected is a king?
7. You are playing roulette on a 38-number wheel (meaning there are 38 mutually exclusive and exhaustive elementary events). Calculate the expected value of the following $25 bets:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Bet Name | Number of “Winning” elementary events | Value of a Loss | Value of a Win | Expected Value? |
| “Straight Up” | 1 | -$25 | $875 |  |
| “Split” | 2 | -$25 | $425 |  |
| “Street” | 3 | -$25 | $275 |  |
| “Corner” | 4 | -$25 | $200 |  |
| “Six Line” | 6 | -$25 | $125 |  |
| “Dozen” | 12 | -$25 | $50 |  |
| “Red” | 18 | -$25 | $25 |  |

1. Using your results from question 5, interpret the expected value of a “Dozen” bet. Specifically, every time you make a $25 “Dozen” bet, you expect to \_\_\_\_\_\_\_\_\_\_\_.
2. As of right now, there are 64 students in this course. Calculate the probability that at least one pair of students shares a birthday. For simplicity, you may assume no one is born on Leap Day and that everyone is equally likely to be born on every day of the year.  
     
   [Note: Number 9 is a “just for fun” question commonly found in probability and statistics textbooks. It involves a lot of calculation and is best attempted in MS Excel rather than on a calculator. Questions that require this much calculation will never show up on a test in this class because they are too time consuming. Still, if you enjoy this subject, you should give it a shot.]