Math 1711	Finite Math	Spring '14

Practice Exam 2

1. An experiment consists of picking a number at random from the set $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$. What is the probability that the number selected is 4? larger than 6? *A:* 1/9

2. Are the following probabilities feasible for an experiment having sample space $\{s_1, s_2, s_3\}$: $Pr(s_1) = .3$, $Pr(s_2) = .5$, $Pr(s_3) = .3$? *A:* No

3. TRUE OR FALSE If the probability of a major earthquake in California this year is .65, then is it true that the odds against an earthquake are 35 to 65? *A:* True

4. An urn contains five white balls and four green balls. An experiment consists of pulling 3 balls from the urn, one at a time without replacement. Find the probability that all three balls selected are green. Find the probability that all 3 balls are white if it is assumed that the last one selected is white. *A:* $Pr(\text{all green}) = 4.8\%$, and using a tree diagram gets $Pr(\text{all white} \mid \text{last one white}) = \frac{\binom{5}{3}/\binom{9}{3}}{280/504} \approx 21.4\%$

5. The 15 members of a senate committee will vote next week on an issue: 10 will vote "yes" and 5 will vote "no". If a reporter samples 6 of the senators in order to predict the outcome of next week's vote, what is the probability that the reporter correctly predicts the outcome of the vote? *A:* $\frac{\binom{10}{6}+\binom{10}{5}\binom{5}{1}+\binom{10}{4}\binom{5}{2}}{\binom{15}{6}} = 3570/5005 \approx 71.3\%$

6. A die is rolled three times. What is the probability that all three rolls show different numbers? *A:* $\frac{6\cdot5\cdot4}{6^3} \approx 55.6\%$

7. A coin is tossed twice. What is the conditional probability that the first toss is a head if it is known that the second toss is a head? *A:* 50%

8. A basketball player is on the line for a one-and-one free throw chance. If the probability he makes a free throw is 60%, which is the greatest probability: scoring 0 points, 1 point, or 2 points? *A:* $Pr(0 \text{ pts}) = .4$, $Pr(1 \text{ pt}) = .24$, $Pr(2 \text{ pts}) = .36$, so 0 pts is most likely.

9. About 5% of all men are colorblind while only 0.4% of women are colorblind. If a person is selected at random from a group of 50 men and 50 women is found to be colorblind, then what is the probability that the person selected is male? *A:* $\frac{2.5}{2.5+.2} \approx 92.6\%$

10. A coin is to be tossed at most 5 times. The player wins if, at any point, the number of heads tossed exceeds the number of tails. The player loses if at any point 3 of the tosses were tails. What is the probability that the player wins the game? *A:* Using a tree one gets $Pr(\text{win}) = \frac{1}{2} + \left(\frac{1}{2}\right)^3 + 2\left(\frac{1}{2}\right)^5 = 68.75\%$