MAT 223, Quiz #8, Fall 2015 Name KEY

Instructions: Show all work. If you use your calculator, state which functions and syntax was used as work.

1. Suppose that three cards are drawn from a deck of 52 cards. What is the probability that your three-card hand will contain all red cards?

$$\frac{26C3}{52C3} =$$

2. What is the probability that a random rearrangement of the letters in "abstruse" will begin and end with a vowel?

$3 \cdot 6P6 \cdot 2 = 4320$

$8P8 = 40,320$

$\frac{4320}{40320} = .107142...$

10.71%

3. Find the expected value of the probability distribution below. What is the variance?

Number of Orders per Week x_i	Probability p_i
41	.03
42	.10
43	.15
44	.17
45	.25
46	.15
47	.10
48	.05

$41*.03 + 42*.10 + 43*.15 + 44*.17 + 45*.25 + 46*.15 + 47*.10 + 48*.05 = 44.61$

$\sigma^2 = 2.9979$

4. Suppose that a dice game, using two standard dice, pays you \$5 if you roll a sum of 4, 7 or 11. You pay \$1 for any other outcome. What is the expected value of the game?

$\frac{6+3+2}{36} = \frac{11}{36}$ $\quad 36-11=25$

$5\left(\frac{11}{36}\right) - 1\left(\frac{25}{36}\right) = \frac{30}{36} = \frac{5}{6}$

5. Calculate the probability of a binomial experiment of exactly 5 successes in 12 trials if $p = \frac{1}{2}$.

$\binom{12}{5}(\frac{1}{2})^5(\frac{1}{2})^7$ or $\frac{12C5}{2^{12}}$ $\approx 19.34\%$

6. Calculate the probability of a binomial experiment of at least 5 successes in 12 trails if $p = \frac{1}{2}$.

1 − binomialcdf $(12, \frac{1}{2}, 4) \approx 80.6\%$