

MORE PRACTICE FOR QUIZ 2 : MATH/CSE 4161

OPEN BOOK, OPEN NOTES, OPEN CALCULATOR, CLOSED FRIENDS AND ENEMIES

- (1) Eight tokens with colored faces are placed in a bag. Three are red/blue, one is red/green, one is blue/green, two are red on both sides and one is green on both sides. A token is taken out at random and placed on the table face up.
 - (a) Given that the up side of the token is red, what is the probability that the down side is green?
 - (b) What is the probability that the down side of the token is green?
- (2) Two dice are rolled and if any 1's appear then the die that is showing 1 is rolled again (if two dice show a 1 the both are rolled again) one time. What is the probability that the sum of the dice is 7?
- (3) Two dice are rolled and if any 1's appear then the die or dice that are showing 1 are rolled again and again until they are not a 1. What is the probability that the sum of the dice is 7?
- (4) Two dice are rolled and if any 1's appear then both dice are rolled again and again until no 1's appear. What is the probability that the sum of the dice is 7?
- (5) Using the Vernam encryption system, the ciphertext is encrypted with the three letter key 'NEW' and a five letter key 'TWIST.' What is the last word of the plaintext if the ciphertext (spaces indicate words in the plaintext) is

OTW GBICQF ZESI XJZTIW

- (6) Say that I make words using a random number generator and choose a three letter word according to the following frequency tables. The first letter of the message is chosen by an initial letter frequency table on the left, the second letter and third letter are chosen by the conditional table on the right so that the rows of the table represent the probability of the next letter appearing given the previous letter. What is the probability of the word being BCA given that the second letter is C? What is the probability of the word being CCC given that the second letter is C?

Initial letter frequency

A	B	C
$3/8$	$3/8$	$1/4$

Conditional letter frequency

	A	B	C
A	$1/4$	$3/4$	0
B	$1/8$	$1/8$	$3/4$
C	0	$1/4$	$3/4$