

# Stat 330

## Homework 2

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<https://courses.lumenlearning.com/sanjacinto-finitemath1/chapter/reading-counting/>

1)

(a)  $|\Omega| \geq |A|$ ,  $|\Omega| \geq 0$ , therefore  $|A| \div |\Omega| \geq 0$ .

This satisfies the first axiom.

(b) By definition, the sum of the probabilities of all outcomes (  $P(A)$  ) is one, satisfying the second axiom.

(c)

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2)

(a)  $12 * 11 * 10 = 1320$  possible permutations

(b) 1320 possible permutations,  $3 * 2 * 1 = 6$  orders per group  
 $1320 / 6 = 220$  possible combinations.

(c)  $3 * 2 * 1 = 6$  possible permutations

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$$\binom{12}{1} \binom{11}{1} \binom{10}{1} =$$

3)

- (a)  $26 + 26 + 3 = 55$  letters, 10 numbers.  
 $55 + 10 = 65$  possible options per character.  
 $65^8 = 3.18644812910^{14}$  possible passwords.

Remove all with no letters ( $10^8$ ) and those with no numbers ( $55^8$ ),  
resulting in  $2.3491077510^{14}$  possible permutations.  
This rounds to 235 trillion permutations.

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4)

- (a)  $8 * 7 * 6 * 5 * 4 * 3 * 2 * 1 = 8! = 40320$  possible ways.

(b) Removing two letter choices effectively makes this a 6 letter word,  
thus there are  $6! = 720$  possible ways.

(c)

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5)  
(a)

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6)  
(a)