

Homework 2

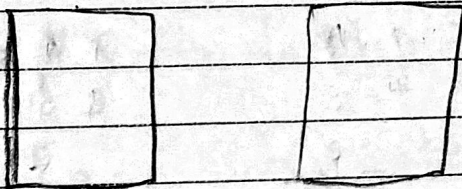
1.

a) $7! = 5040$ possibilities

b) $\frac{9!}{2!} = 7! = 5040$ possibilities

2.

$$2^6 = 64 - 2 = 31$$



bits flipped are eliminated - 2

a) 31 possibilities

b) Find bits that are same forward and backwards and subtract from a
 $31 - 8 = 23$

2	0111110	111111
000000	011111	
000001	100000	
000010	100001	
000011	100010	
000100	100011	
000101	100100	
000110	100101	
000111	100110	
001000	100111	
001001	101000	
001010	101001	
001011	101010	
001100	101011	
001101	101100	
001110	101101	
001111	101110	
010000	101111	
010001	110000	
010010	110001	
010011	110010	
010100	110011	
010101	110100	
010110	110101	
010111	110110	
011000	110111	
011001	111000	
011010	111001	
011011	111010	
011100	111011	
011101	111100	
011110	111101	
011111	111110	

3.

a) $\frac{12!}{(12-6)!6!} = 924$ possibilities because we only care about which candidates are chosen, not the different orders of choices.

b) $6! = 720$ possibilities

c) $(6-1)! = 120$ possibilities because the initial person is what sets the starting and ending point.

$$d) \frac{1}{5!} = \frac{1}{120}$$

$$e) \frac{12 \cdot 11}{2} = 66 \text{ possibilities}$$

4.

$$a) 26 \cdot 25 \cdot 24 \cdot 23 \cdot 22 \cdot 21 \cdot 20 \cdot 19$$

62,990,928,000 possibilities
26 is much better

b) 2 digits, 5 capital letters, one special character (12)

$$\frac{8!}{(2!)(5!)(1!)} = \frac{40,320}{240} = 168$$

$$10^2 = 100$$

$$26^5 = 11,881,376$$

$$12 = 12$$

$$10^2 \times 26^5 \times 12 = 1.42e^{10} \times 168 = 2.4e^{12}$$

5. abcd 1 point right 0.25 wrong

a) $\frac{1}{3}$ probability of getting right
 $\frac{2}{3}$ probability of getting wrong

b) $P(3 \text{ wrong}) = \frac{2}{6} = \frac{1}{3}$ probability 4 - 75 = 3.25 points
 $P(2 \text{ wrong}) = \frac{1}{2}$ probability 4 - 5 = 3.5 points
 $P(0 \text{ wrong}) = \frac{1}{6}$ probability 4 - 0 = 4 points