ANSWERS

FRS HW1
Kouba
Fundamental Principle of Counting

1.) Jill, Jenny, Jasmine, Jane, Joe, Jake, and Jack are to be seated in a row of 7 chairs. How many ways can this be done if

a.) the women and men can sit in any chair ?

b.) the women must sit together ?

c.) the men must sit together ?

d.) the women must sit together and the men must sit together ?

e.) no woman can sit next to a woman and no man can sit next to a man ?

f.) Jack and Jill must sit next to each other ?

2.) Two identical red tennis balls and three identical green tennis balls are to be arranged in a row of 5 balls. How many ways can this be done if

a.) the colors can be arranged in any order ?

b.) the red balls must be next to each other ?

c.) the green balls must be next to each other ?

d.) the green balls cannot be adjacent to each other ?

e.) the red balls cannot be adjacent to each other ?

FRS HW #1

1.) a.) $7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 7! = 5040$

b.) $4! \cdot 3! \cdot 4 = 576$

$4!$: order women; $3!$: order men; 4: seat women

c.) $3! \cdot 4! \cdot 5 = 720$

$3!$: order men; $4!$: order women; 5: seat men

d.) $4! \cdot 3! \cdot 2 = 288$

$4!$: order women; $3!$: order men; 2: sit down

e.)

W	M	W	M	W	M	W

$4! \cdot 3! = 144$

$4!$: order women; $3!$: order men

f.) $6 \cdot 5! \cdot 2 = 1440$

6: seat pair; $5!$: seat others; 2: order Jack + Jill

2.) 2 Red, 3 Green

a.) all different ways to place greens:

GGG_ _
GG_ G _
GG_ _ G
G_ GG _
G_ G_ G
G _ _ GG
_ GGG _
_ GG_ G
_ G_ GG
_ _ GGG

} 10 ways

b.) RR_ _ _
_ RR_ _
_ _ RR_
_ _ _ RR

} 4 ways

c.) GGG_ _
_ GGG _
_ _ GGG

} 3 ways

d.) G_ G_ G } 1 ways

e.) (all ways) − (Red together) = 10 − 4 = 6