FRS HW4
Kouba
Combinations

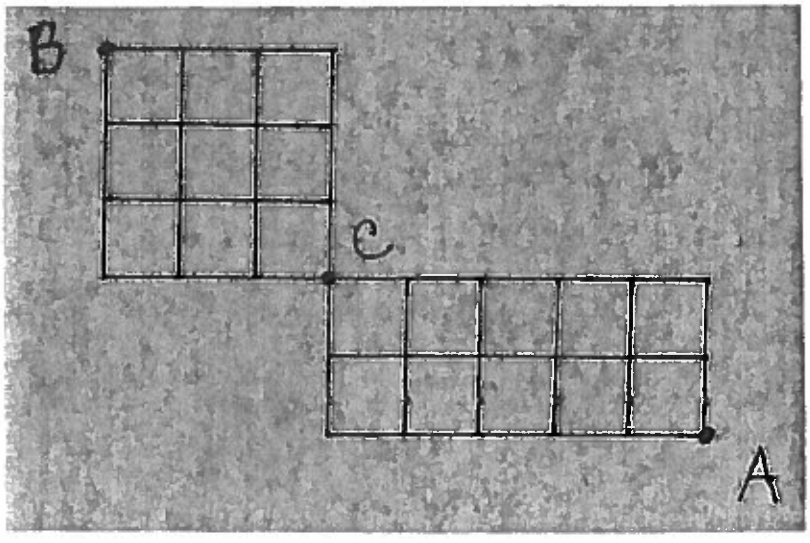
1.) How many different permutations are there of the letters in the word "Pogonotrophy" ?

2.) How many ways can you get three of a kind (for example, 3 queens and 2 other different cards) in a 5-card poker hand ?

3.) How many ways can you get three pairs (for example, 2 kings, 2 nines, and 2 sevens) in a 6-card poker hand ?

4.) A committee of 10 is to be formed from 7 girl and 9 boy middle school students. How many different ways can this be done if there must be at least 5 girls on the committee ?

5.) How many ways can you get from point A to point B in the following grid if you can only go "up" or "left" ?



H.W. #4 Solutions

1.) 12 letters, 2 p's, 4 o's : so

$$\frac{12!}{2!4!} = 9,979,200$$

2.) $\underbrace{C(13,1)}_{\text{pick triple face}} \cdot \underbrace{C(4,3)}_{\text{pick 3 of 4}} \cdot \underbrace{C(12,2)}_{\text{pick 2 others}} \cdot \underbrace{C(4,1)}_{\text{pick 1 of 4}} \cdot \underbrace{C(4,1)}_{\text{pick 1 of 4}}$

$= 54,912$

3.) $\underbrace{C(13,3)}_{\text{pick 3 face values}} \cdot \underbrace{C(4,2)}_{\text{pick 2 of 4}} \cdot \underbrace{C(4,2)}_{\text{pick 2 of 4}} \cdot \underbrace{C(4,2)}_{\text{pick 2 of 4}} = 61,776$

4.) $(5G, 5B) + (6G, 4B) + (7G, 3B)$

$= C(7,5) \cdot C(9,5) + C(7,6) \cdot C(9,4) + C(7,7) \cdot C(9,3)$

$= (21)(126) + (7)(126) + (1)(84)$

$= 3612$

5.) (A to C) • (C to B)

$= \left(\frac{7!}{5!\,2!}\right)\left(\frac{6!}{3!\,3!}\right)$

$= (21)(20) = 420$