Sec. 11.1 and 11.2 - Counting with lists, tables, trees, and the FCP.

HW 11.1 #1-6, 9-25 odd, 34, 35
11.2 #1, 31-34.

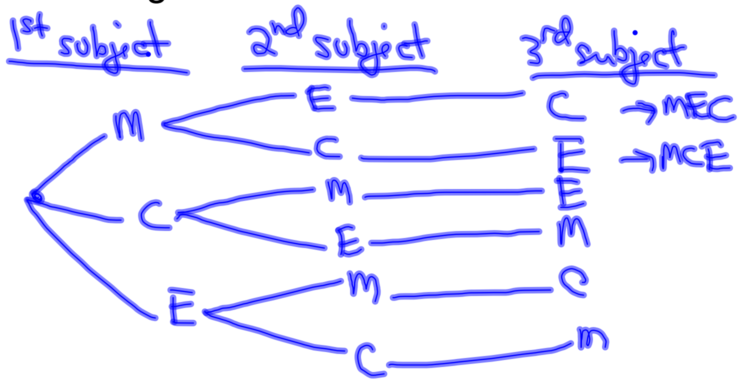
Sep 3-8:16 AM

Carlos has homework to do in Math, Chemistry, and English. How many ways can he choose the order in which to do his homework?

- Systematic List

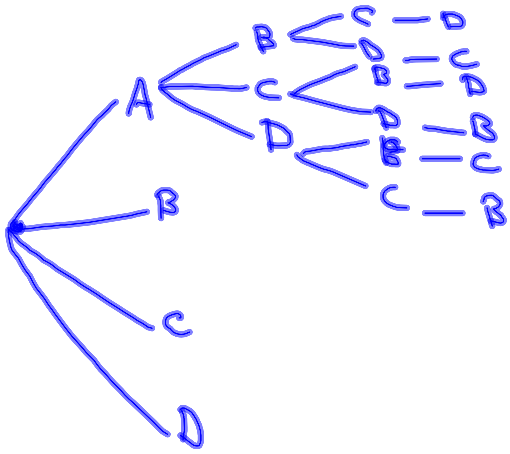
MCE EMC
MEC ECM
CME
CEM

- Tree Diagram



Sep 3-8:23 AM

Each question on a four-question multiple-choice quiz has answer choices labeled A, B, C, and D. How many different ways can a student answer the four questions if he uses each choice only once?



ABCD
ABDC
ACBD
ACDB
ADBC
ADCB

$n_1 = 4$
$n_2 = 3$
$n_3 = 2$
$n_4 = 1$

How many possible ways? Why?

$6 \times 4 = 24 = 4 \times 3 \times 2 \times 1$

Sep 3-8:28 AM

Determine the number of two digit-numbers that can be written using the digits {0, 1, 2, 3} assuming that repeated digits are allowed?

- Product Table

2nd choice (digit)

1st choice (digit)	0	1	2	3
1	10	11	12	13
2	20	21	22	23
3	30	31	32	33

12 options

Sep 3-8:29 AM

Determine the number of two digit-numbers that can be written using the digits {0, 1, 2, 3} assuming that repeated digits are <u>not</u> allowed?

- Product Table

2nd choice (digit)

1st choice (digit)	0	1	2	3
1	10	~~11~~	12	13
2	20	21	~~22~~	23
3	30	31	32	~~33~~

9 choices

3×3

Sep 3-8:29 AM

Determine the number of two digit-numbers that can be written using the digits {0, 1, 2, 3} assuming that number is even?

- Product Table

2nd choice (digit)

1st choice (digit)	0	1	2	3
1	10	~~11~~	12	~~13~~
2	20	~~21~~	22	~~23~~
3	30	~~31~~	32	~~33~~

6 options

$6 = 3 \times 2$

Sep 3-8:29 AM

Determine the number of two digit-numbers that can be written using the odd digits assuming that repeated digits are allowed?

- What might be a strategy that could help you solve this problem? Why do you think it will work?

$5 \times 5 = 25$

Sep 3-8:29 AM

Fundamental Counting Principle

§11.2

Suppose that a task involves a sequence of *k* choices that satisfies the **uniformity criterion**.

Let n_1 be the number of ways the first stage or event can occur, n_2 be the number of ways the second stage or event can occur, continuing on through the k^{th} stage.

Then the total number of different ways the task can occur is given by:

$$n_1 \times n_2 \times n_3 \times \ldots \times n_k$$

Sep 3-8:32 AM

Here are the names of the members of the Teacher Education Club.

Members:
{Amy, Beth, Craig, Danielle, Ethan, Francine, George}

1. In how many ways can they be lined up for a photograph?

$7\times6\times5\times4\times3\times2\times1 = 5040$

2. In how many ways can the Teacher Education Club elect a president and vice-president from its members?

$7\times6 = 42$

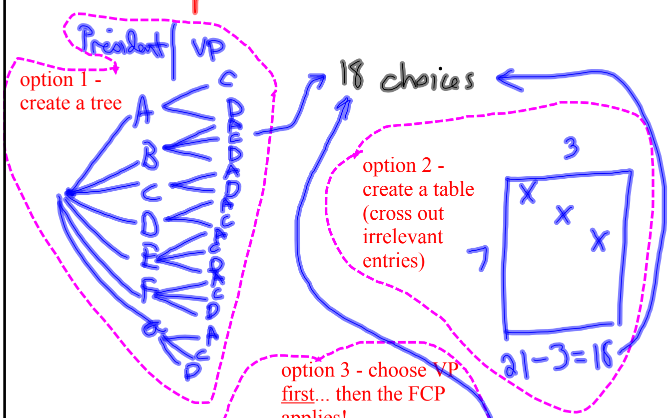
Sep 3-9:13 AM

Members -- Freshmen are noted with (F):
{Amy(F), Beth, Craig(F), Danielle(F), Ethan, Francine, George}

3. How many ways can a president and vice-president be elected if the vice-president must be a freshman?

** Can we use the Fundamental Counting Principal here?

No: the # of V.P. choices depends on whether a Freshman was chosen as president.



option 3 - choose VP first... then the FCP applies!

Choose V.P. first.

$3\times6 = 18$

fresh, others left

Sep 3-8:34 AM