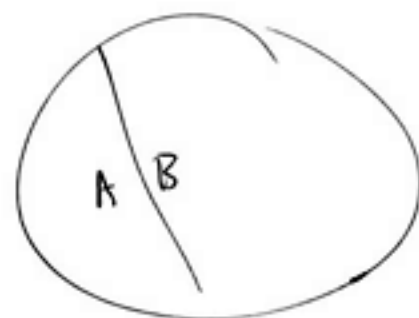
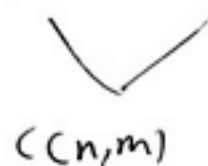


CSC 2259 1/30/20 Notes

$C(n-1, m-1)$ $C(n-1, m)$

last lecture... $C(n, m) = C(n-1, m) + C(n-1, m-1)$

Symmetry: $C(n, m) = C(n, n-m)$



$$X = A \cup B$$

union
disjoint

$$|X| = |A| + |B|$$

box of 10 fruits

7 are sour
6 are big

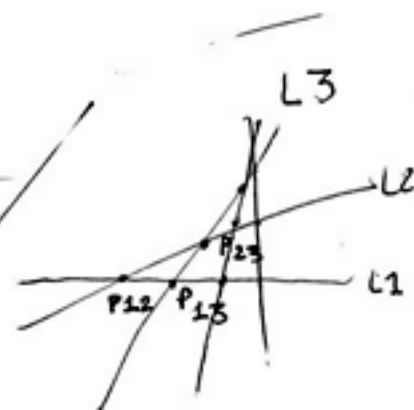
② At most 6 are sour and big

① At least 3 are sour and big

③ three are not sour

④ four are not big

Max # (intersection points of $\{L_1, L_2, \dots, L_n\} =$
 $1 + 2 + 3 + \dots + n - 1 = \frac{n(n-1)}{2}$
 $C(n, 2)$



Any 3
mutually
intersecting
lines form a Δ

there are exactly
2 lines thru an
intersection point

(4, 3) triangles?

1. AF can't be a line

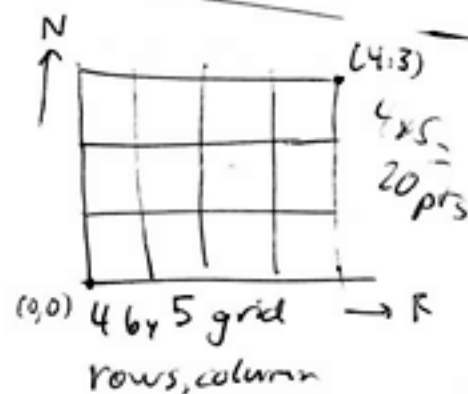
2. some points are on same line

(6, 3) triangles
2 reasons it's
wrong

there are points
not joined by
any of the lines

there are pairs
of points not
joined by any L_i

there are
3 or more
collinear points



2 1 2 R R N N N

$\frac{7!}{4!3!} = \frac{7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{4 \times 3 \times 2 \times 1 \times 3 \times 2 \times 1} = 35$

$\binom{7}{4} = \binom{7}{3}$

$= 35$

he does by casework

(ways with 0 turns) = 0

(1) = 2

(2) =

7:20-8:00
8:00-8:30
8:30-9:00
9:00-9:30
9:30-9:59

complement
of binary string

$$00001^c = 11110$$

5 bit binary strings

$$00000 \text{ to } 11111 \quad \left(\begin{smallmatrix} 5 \\ 6 \end{smallmatrix} \right)$$

$$\begin{array}{l} 0111 \\ 1000 \end{array} \left. \vphantom{\begin{array}{l} 0111 \\ 1000 \end{array}} \right\} 5 \quad \left(\begin{smallmatrix} 5 \\ 1 \end{smallmatrix} \right)$$

$$\begin{array}{l} 1111 \\ 0000 \end{array} \left. \vphantom{\begin{array}{l} 1111 \\ 0000 \end{array}} \right\} 10 \quad \left(\begin{smallmatrix} 5 \\ 2 \end{smallmatrix} \right)$$

$$\begin{array}{l} 00111 \\ 11100 \end{array} \left. \vphantom{\begin{array}{l} 00111 \\ 11100 \end{array}} \right\} 10 \quad \left(\begin{smallmatrix} 5 \\ 3 \end{smallmatrix} \right)$$

$$\begin{array}{l} 01111 \\ 10111 \\ 11011 \\ 11101 \\ 11110 \end{array} \left. \vphantom{\begin{array}{l} 01111 \\ 10111 \\ 11011 \\ 11101 \\ 11110 \end{array}} \right\} 5 \quad \left(\begin{smallmatrix} 5 \\ 4 \end{smallmatrix} \right)$$

$$11111 \text{ to } 00000 \quad \left(\begin{smallmatrix} 5 \\ 5 \end{smallmatrix} \right)$$