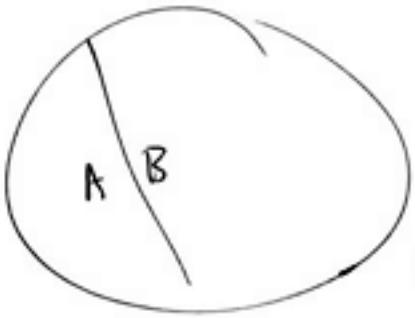
CSC 2259 1/30/20 Notes

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

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

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

$C(n,m)$



$X = A \cup B$

union

disjoint

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

box of 10 fruits

7 are sour

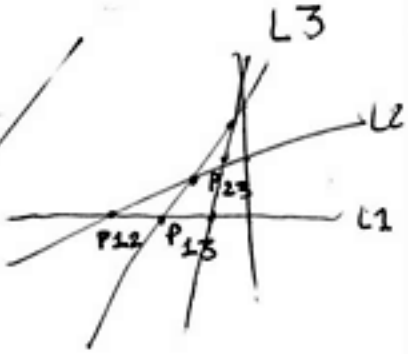
6 are big

(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 $\{L_1, L_2, \dots, L_n\}$) =

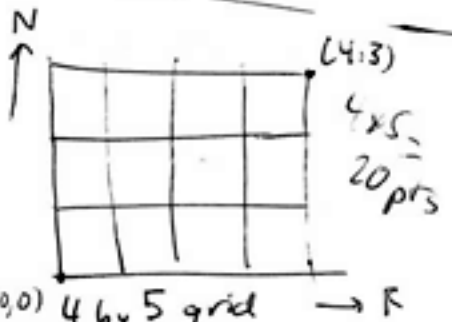
$1+2+3+\dots+n-1 = \frac{(n)(n-1)}{2}$

$C(n,2)$

Any 3 mutually intersecting lines form a △

there are exactly 2 lines, then an intersection point

((4,3) triangles? (lines)



1. AF can be a line
2. some points are on same line

((6,3) triangles (pts)

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

there are 3 or more collinear points

RRRRNNN

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

$\binom{7}{4} = \binom{7}{3}$ = 35

he does by casework

(ways with 0 turns) = 0

(1) = 2

(2) =

Complement of binary string $00001^c = 11110$

5 bit binary strings

$00000 \rightarrow 1 \quad \binom{5}{0}$

$0\,1$
$1\,0$ $\rightarrow 5 \quad \binom{5}{1}$

$11\,0$
$1\,0\,1$
$0\,1\,1$ $\rightarrow 10 \quad \binom{5}{2}$

00111
$\vdots$
11100 $\rightarrow 10 \quad \binom{5}{3}$

01111
10111
11011
11101
11110 $\rightarrow 5 \quad \binom{5}{4}$

$11111 \rightarrow 1 \quad \binom{5}{5}$