$A = \{1, 2, 3, \ldots, 10\}$ $\quad \#[1] = 6$

1 _ _ _ _ _ _ _ _ _

C^9_5

C^4_2

13 24

24 13

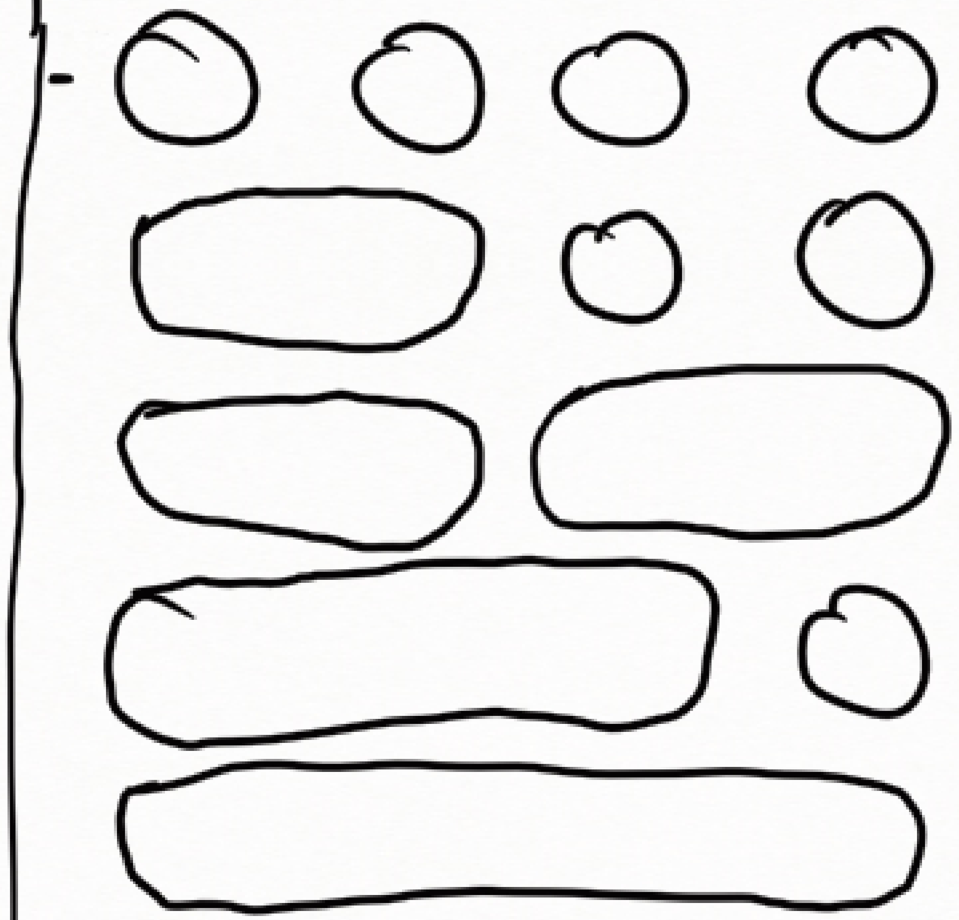
15 ← Cantidad de relaciones de eq con 4 elems.

x_1 x_2 x_3 x_4

$x_1 \; x_2 \; x_3 \; x_4$

$x_1 x_2$ $\quad x_3 x_4$

$x_1 x_3$ $\quad x_2 x_4$



1

$6 = C^4_2$

$3 = C^4_2/2$ ← 13 24 = 24 13

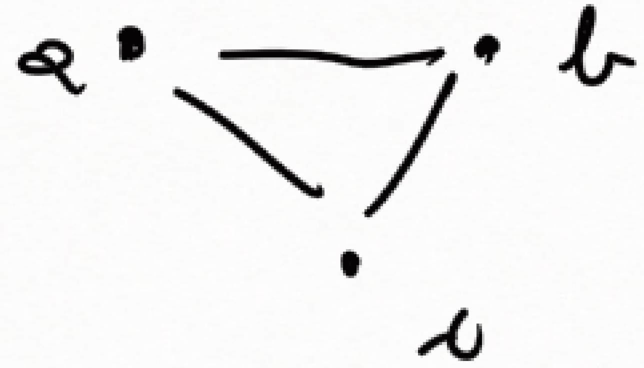
4 $\qquad 1+6+3+4+1 = 15$

1

$C^9_5 \cdot 1 + C^9_5 \cdot 6 + C^9_5 \cdot 4 + C^9_5 \cdot 1 = C^9_5 (1+6+4+1)$

$C^9_5 \times 15 = \dfrac{9 \times \cancel{8} \times 7 \times 6}{\cancel{4} \times \cancel{3} \times \cancel{2}} \times \cancel{15}\,5$

$= 9 \times 7 \times 6 \times 5 = 1890$

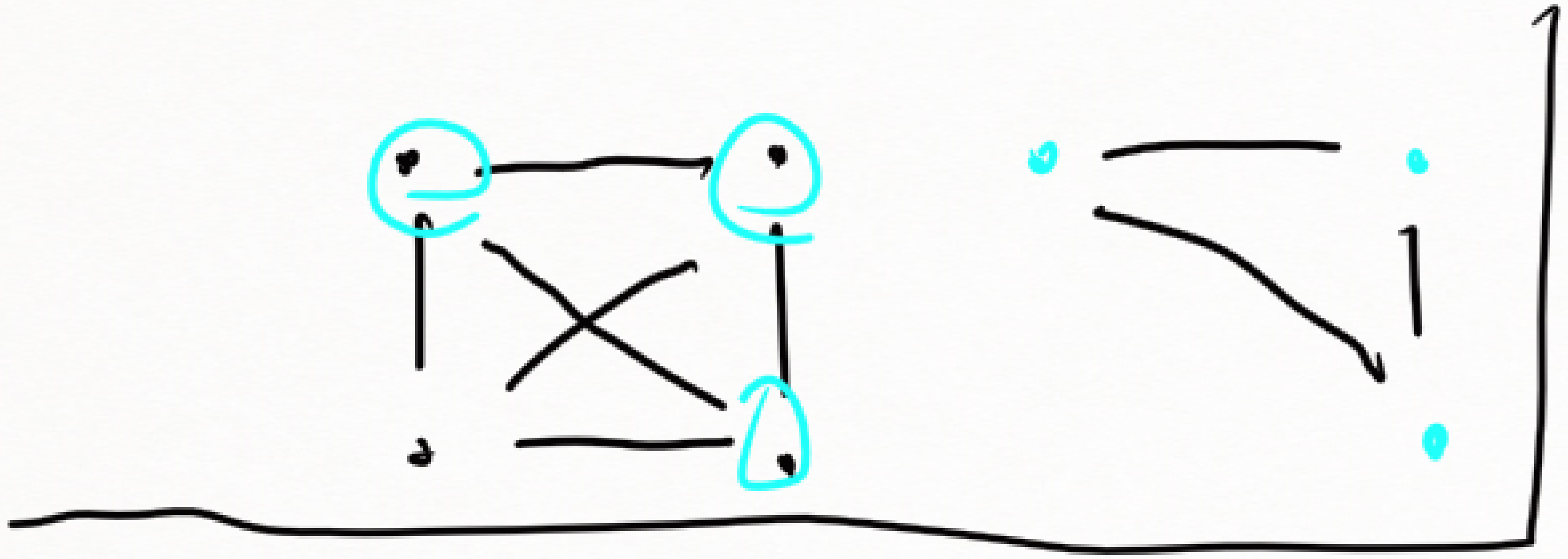


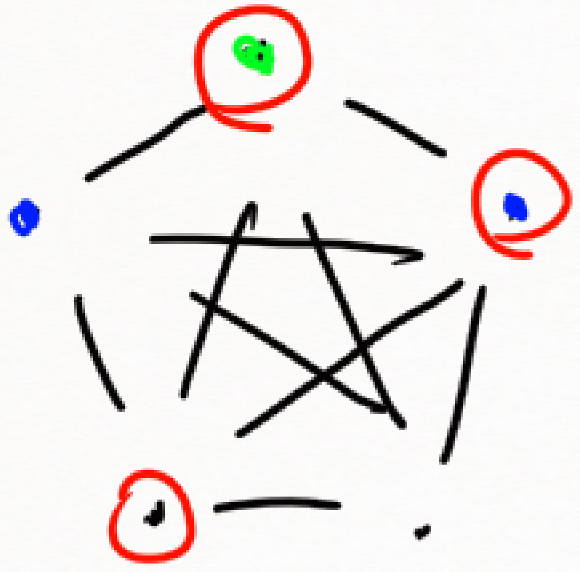
a_n : caminos de largo n de a a a

b_n : " " " n de a a b

c_n : " " " n de a a c

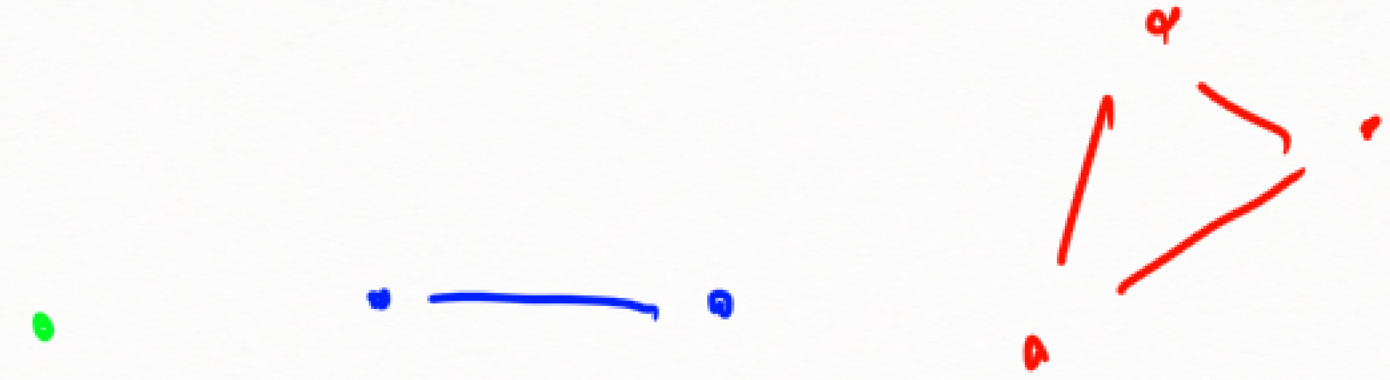
$$\boxed{a_n = b_{n-1} + c_{n-1} \quad b_n = a_{n-1} + c_{n-1} \quad c_n = a_{n-1} + b_{n-1}}$$





Si nos quedamos con m vertices queda K_m

$\Rightarrow$ Pueden quedar K_1, K_2, K_3, K_4 o K_5



K_1 K_2 K_3

Euler: $v - e + r = 2$ (Conexo)

($= k+1$ si hay k comp. conexas)

Ejemplo

$6 = r$

$9 = e$

$$\sum_R \overbrace{gr(R)}^{3} = 2e$$

$$\| $$

$$\sum_R 3 = 3r$$

$\Rightarrow$ $3r = 2e \Rightarrow r = \frac{2}{3}e$

$$v - e + \frac{2}{3}e = 2$$

$$\Rightarrow v - \frac{1}{3}e = 2 \Rightarrow 3v - e = 6$$

$$\Rightarrow \boxed{3v = e + 6}$$

un número es múlt de 3 $\Leftrightarrow$ la suma de sus dígitos lo es

sup G tiene 2005 aristas

$3v = 2005 + 6 = 2011$ Abs

2011 no es div. entre 3

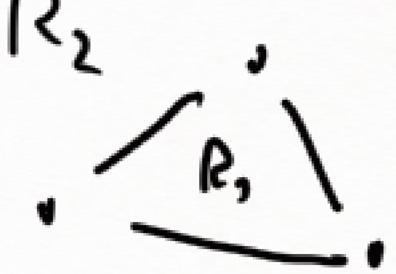
$2 + 0 + 1 + 1 = 4$ ✗

La A no es

$3v = e + 6$

Contra ej:

$\Rightarrow$ No es la B



$v = 3$

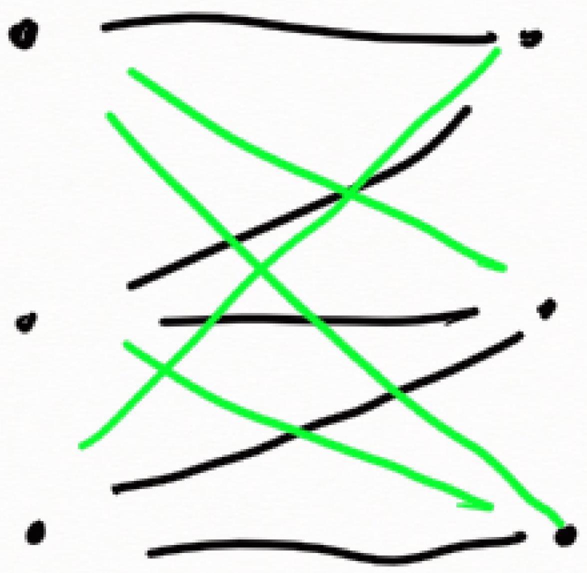
$e = 3$

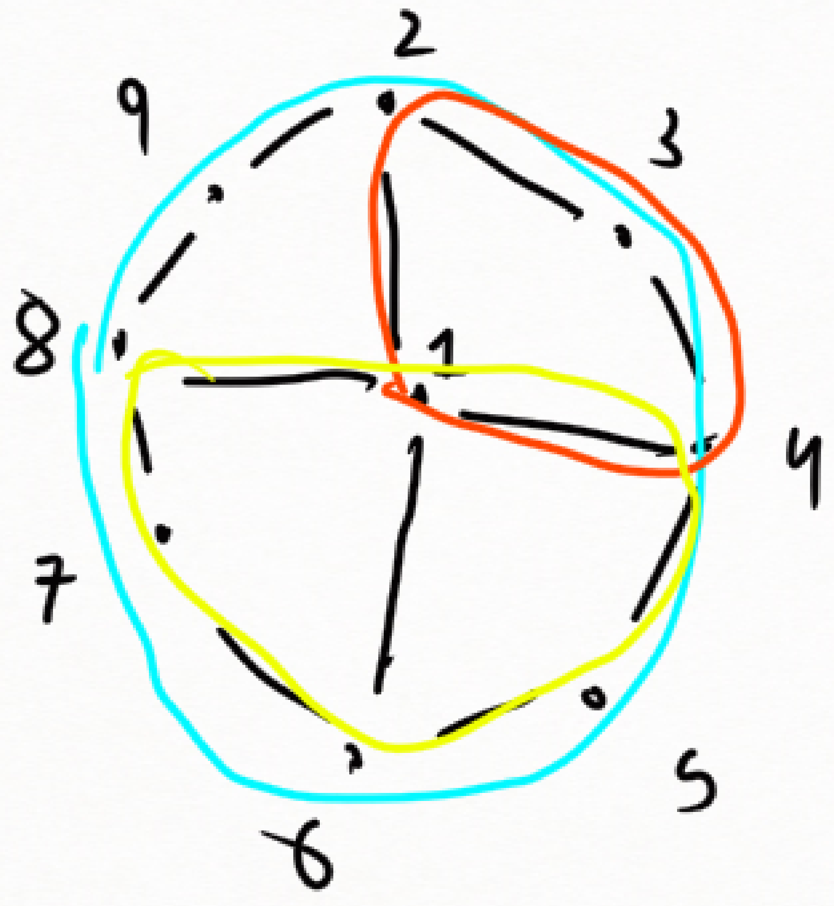
$F = 2$

$gr(R_1) = gr(R_2) = 3$

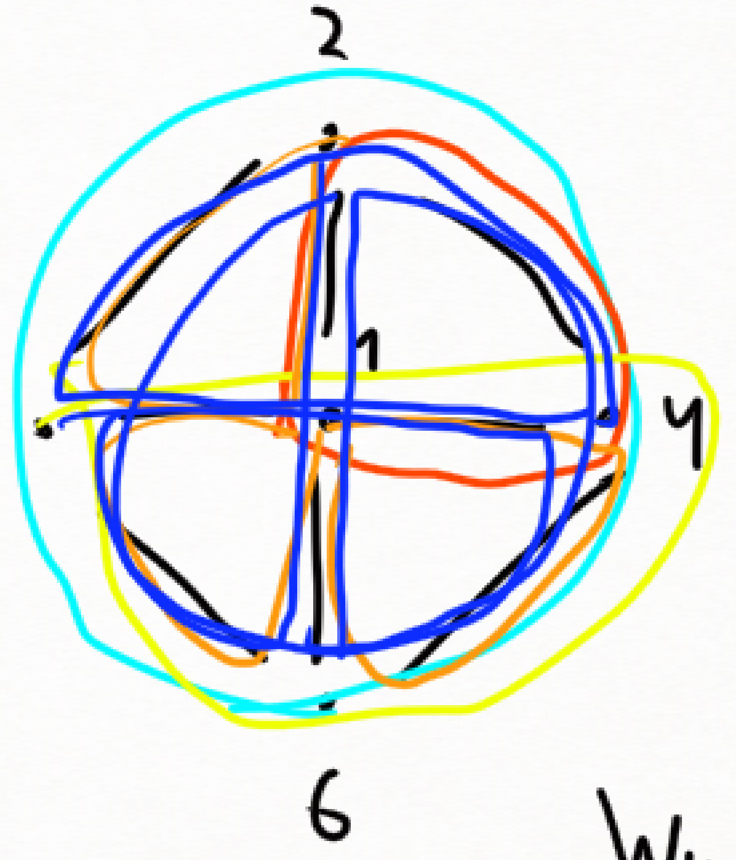
$n = 3$ $\quad$ $n = 4$ $\quad$ $n = 5$ $\quad$ $n = 6$

siempre se puede agregar un vértice adentro de un triángulo





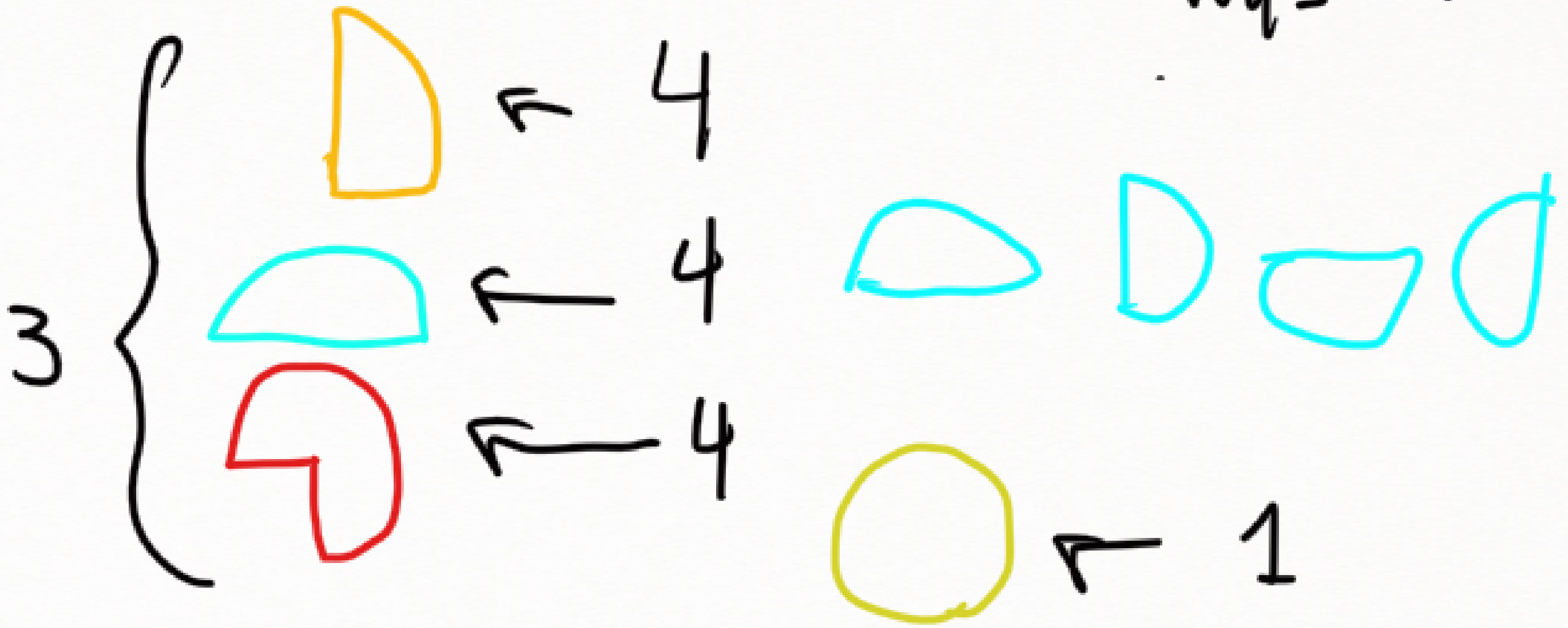
$\simeq$



$W_{n/2}$

$W_4 = 4 \times 3 + 1$

Contar los ciclos de W_4



$$A = \{1,2,3,4,5,6,7\} \qquad |A| = 7$$

$m_1 = \#[1]$ $\quad m_2 = \#[2]$ $\quad m_3 = \#[3]$ $\qquad m_1 > m_2 > m_3 \geq 1$

$m_1 + m_2 + m_3 \leq 7$

Si $m_3 \geq 2 \Rightarrow m_2 \geq 3 \quad m_1 \geq 4 \quad \Rightarrow m_1 + m_2 + m_3 \geq 2 + 3 + 4 = 9$ ✗

$\Rightarrow \boxed{m_3 = 1}$ El 3 tiene que estar solo.

Si $m_2 \geq 3 \Rightarrow m_1 \geq 4 \Rightarrow m_1 + m_2 + \underbrace{m_3}_{1} \geq 3 + 4 + 1 = 8$ ✗

$\Rightarrow \boxed{m_2 = 2}$

$m_1 \to 3 \qquad m_1 + m_2 + m_3 = 6$ ✓

$m_1 \to 4 \qquad m_1 + m_2 + m_3 = 7$ ✓

$m_1 = 3$

$(1\ \_\ \_)\ (2\ \_)\ (3)\ (\_)$

4 $\quad$ 1

2 $\quad$ 2

4, 5, 6, 7

$\Rightarrow 2\,C^4_2 = 12$

$m_1 = 4$

$(1\ \_\ \_\ \_)\ (2\ \_)\ (3)$

$C^4_3 \quad 1$

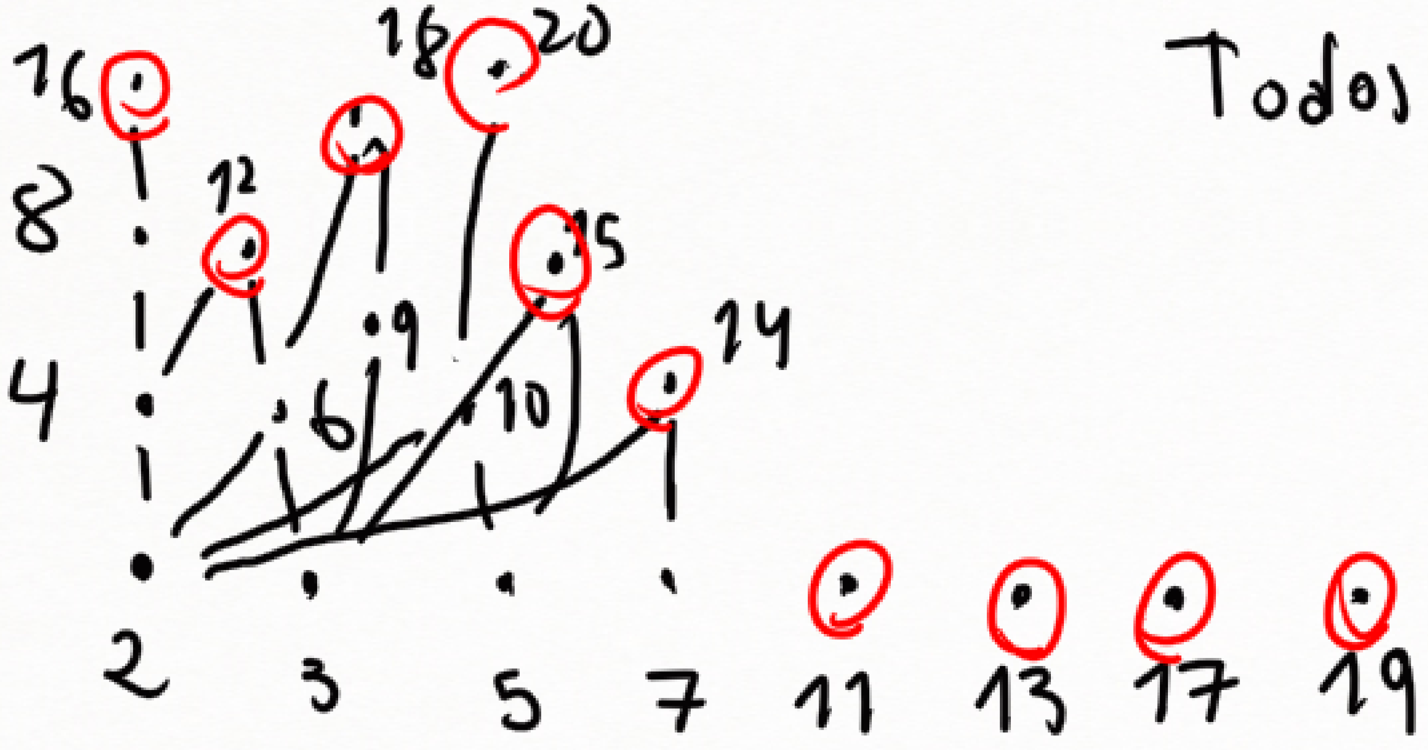
$\Rightarrow C^4_3 = 4$

$\boxed{A=\{2,3,4,\dots,20\}}$ $aRb \iff a$ divide a b

$2R4 \quad 2R6 \quad 3R6 \dots$ $\iff b$ múltiplo de a

p número primo $\quad xRp \iff x=1$ o $x=p$

como $1\notin A$, los primos son todos minimales. $\quad m=8$



$\sup\{2,3\}=6$

Todos los $n>10$ son maximales

$M=10$

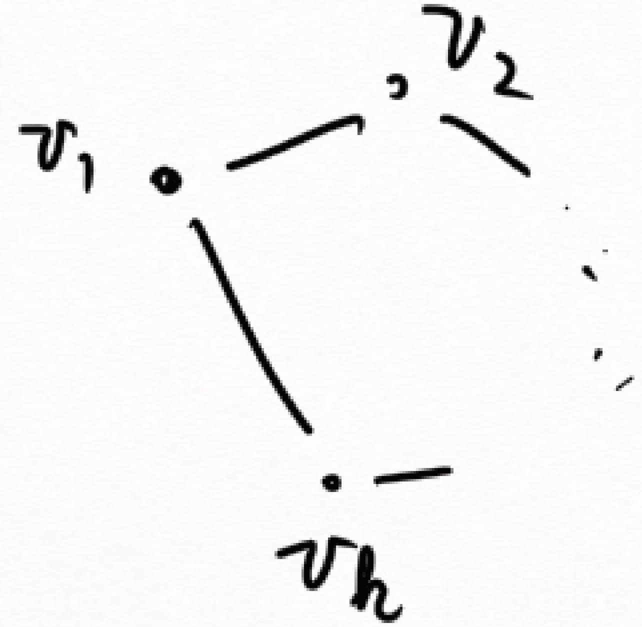
Los 10 maximales son una anticadena $\implies \alpha \geq 10$

Por otra parte no es retículo

Por ej $\nexists$ supremo de $\{11,13\}$

K_n: Hay una arista entre cada par de vértices.

$v_1 v_2 \ldots v_k v_1$



Cualquier secuencia de k vértices distintos induce un ciclo de largo k

$\underline{\;v_1\;}\ \underline{\;v_2\;}\ \ldots\ \underline{\;v_k\;}$ v_1 de nuevo

$n \quad n-1 \quad \ldots \quad (n-k+1)$

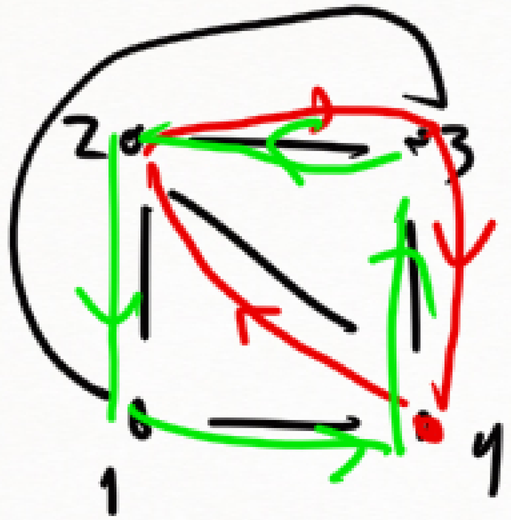
$$n(n-1)\ldots(n-k+1) = \frac{A^n_k}{2k}$$

no importa vértice inicial ni sentido

2 sentidos

k vértices iniciales

K_4

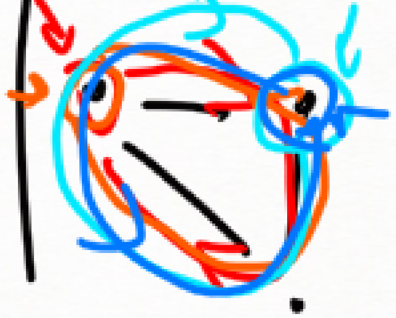


$-4-2-3-4$

$-3-2-1-4-3$

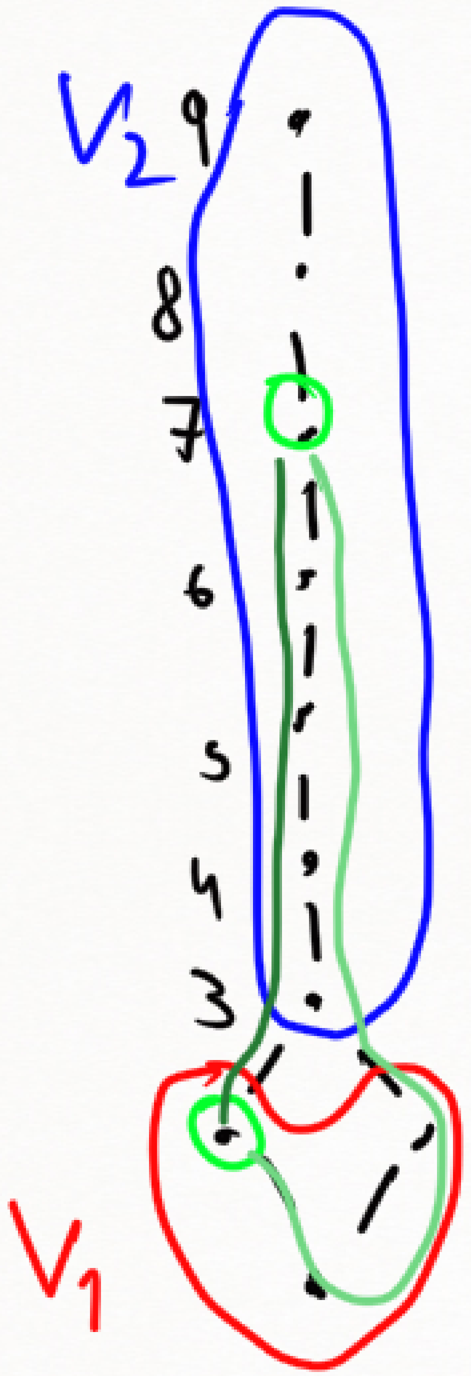
$$\sum_{k=3}^{n} \frac{A^n_k}{2k}$$

$k=3$



6 veces

Los homeomorfos a K_2 = caminos simples

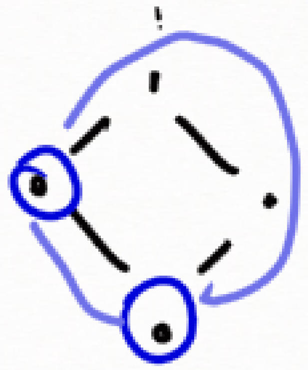


3 casos.

Caso 1: dos extremos en V_2. C^7_2

Caso 2: un extr en V_1 y otro en V_2: $7 \times 3 \times 2$

Caso 3: dos extremos en V_2: $C^3_2 \times 2$



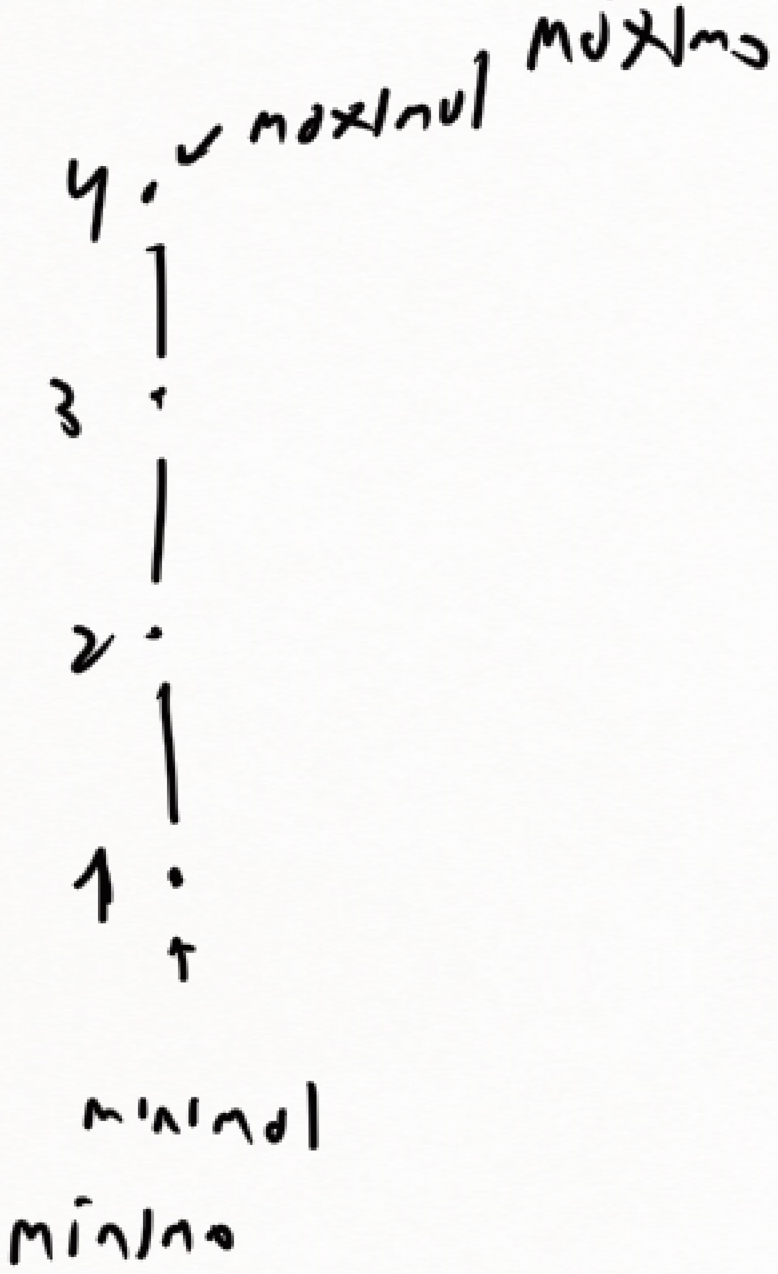
Res: $C^7_2 + 7 \times 3 \times 2 + C^3_2 \times 2$

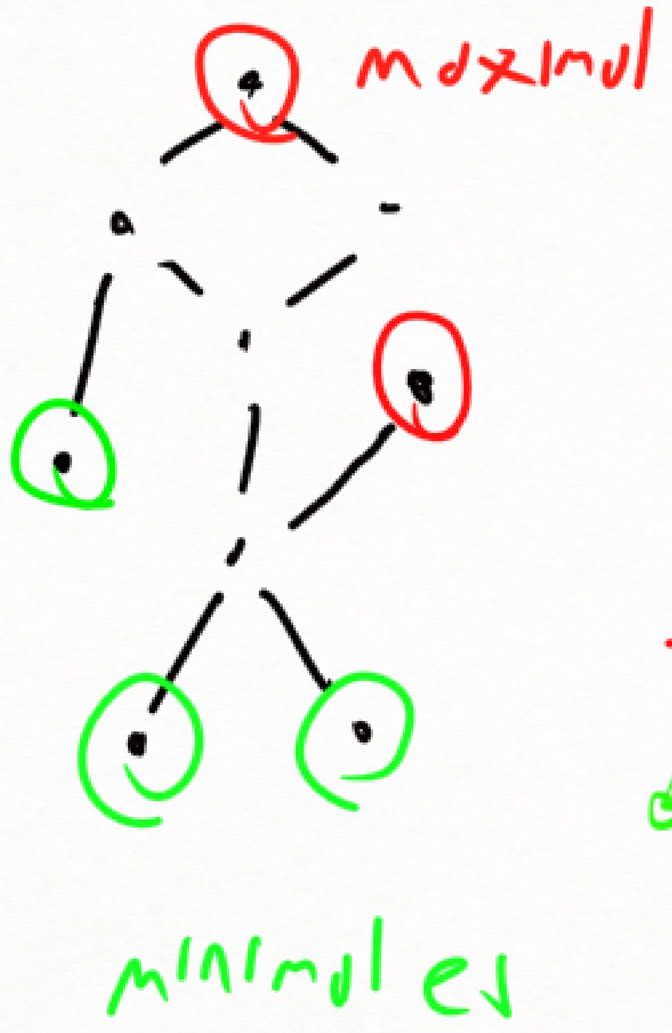
$|R|$ = cantidad de unos en la matriz

$$R = \{(1,1), (2,2), (3,3), (4,4), (5,5), (6,6), (7,7)\}$$

$$|R| = 7$$

$$\begin{pmatrix} 1 & 0 & & & & & \\ 0 & 1 & 0 & & & & \\ & 0 & 1 & & & & \\ & & & 1 & & & \\ & & & & 1 & & \\ & & & & & 1 & \\ & & & & & & 1 \end{pmatrix}$$



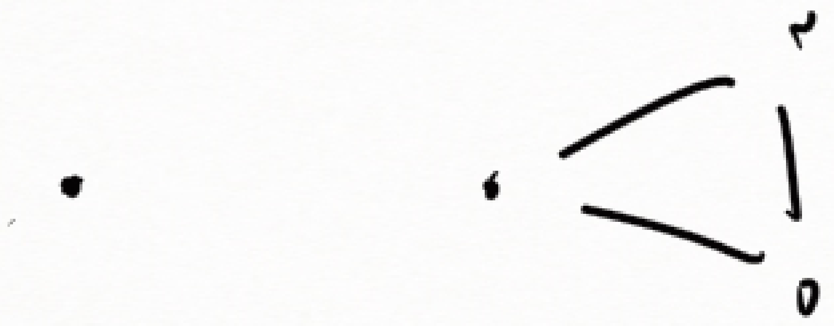


maximal: no tine nadie arriba*

minimal: no tine nade abajo*

* no le salen líneas para arriba

* no le salen líneas para abajo



$v = 4 \qquad e = 3$