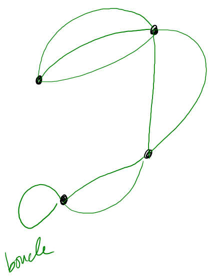
Graphes



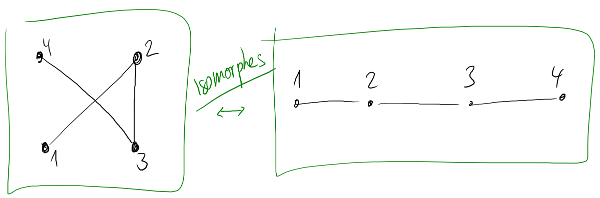
sommets : X $\#X = n$ (nombre)

arêtes : E $\#E = m$

$G(X; E)$

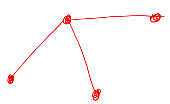
$e \in E$ $e = \{x, y\}$

$e = xy = yx$



$X = \{1; 2; 3; 4\}$

$E = \{\{1,2\}; \{2,3\}; \{3,4\}\}$



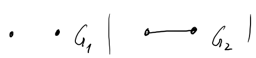
Graphes non étiquetés à n sommets ($n = 2, 3, 4$)

simples
pas d'arêtes multiples
pas de boucles

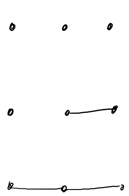
$X_1 = \{A, B, C, D\}$ $X_2 = \{1, 2, 3, 4\}$

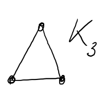
$\{\{A, C\}; \{B, D\}\}$ $E_2 = \{\{1, 2\}, \{3, 4\}\}$

$\boxed{n=2}$



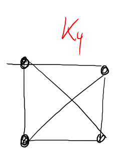
$\boxed{n=3}$



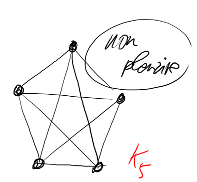


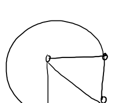
Graphe complet à 3 sommets

$\boxed{n=4}$



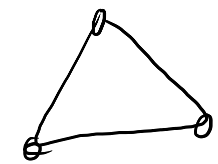
$\boxed{n=5}$





Soit G un graphe simple à n sommets

$$m \le \frac{n(n-1)}{2}$$



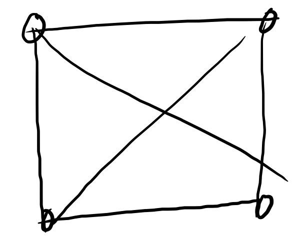
3

$\frac{2\cdot 3}{2}$

$3+2+1$

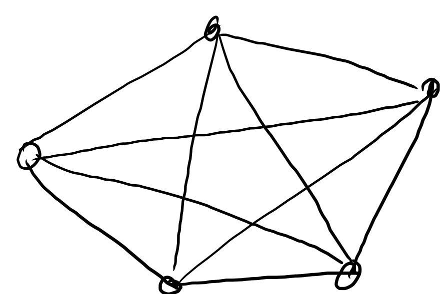
$1+2+3$

$4+4+4$



6

$\frac{3\cdot 4}{2}$



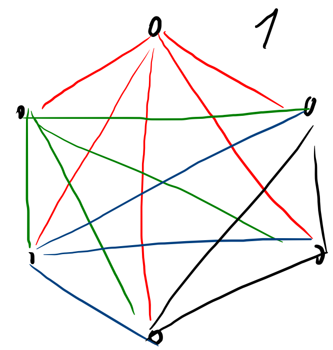
10

$\frac{4\cdot 5}{2}$

6 6 6 6 6

$5+4+3+2+1$

1 2 3 4 5

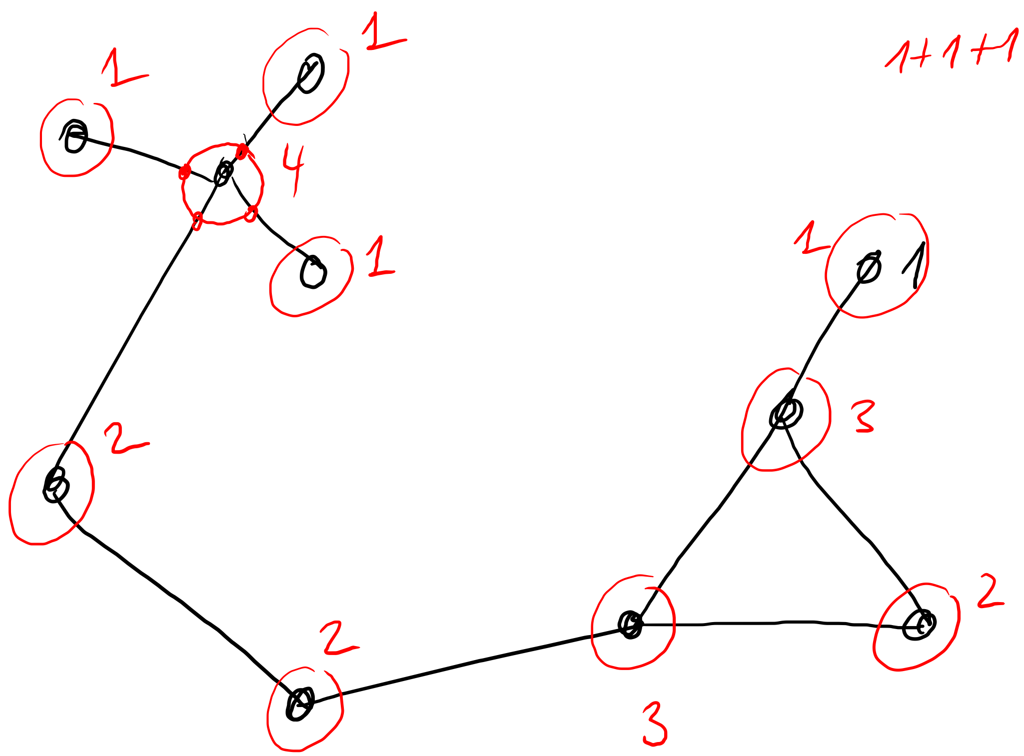


$\frac{5\cdot 6}{2}$

$1+1+1+4+2+2+3+2+3+1 = 20$

$\#X = 10 = n$

$\#E = 10 = m$

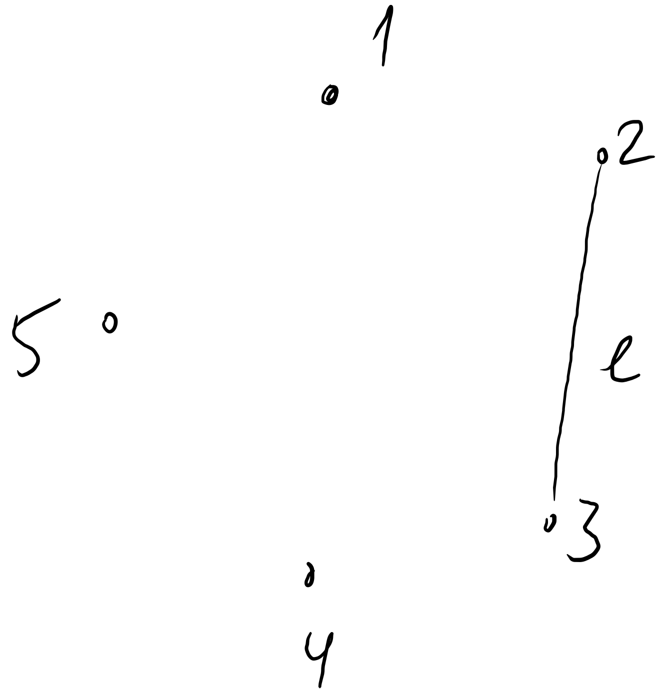


$\deg(1) = 1$

$G(X, E)$

$(2k+1)(2\ell+1) \equiv 1 \bmod 2$

$$\sum_{x \in X} \deg_G(x) = 20 = \underline{\underline{2m}}$$



sommets $X = \{1; 2; 3; 4; 5\}$

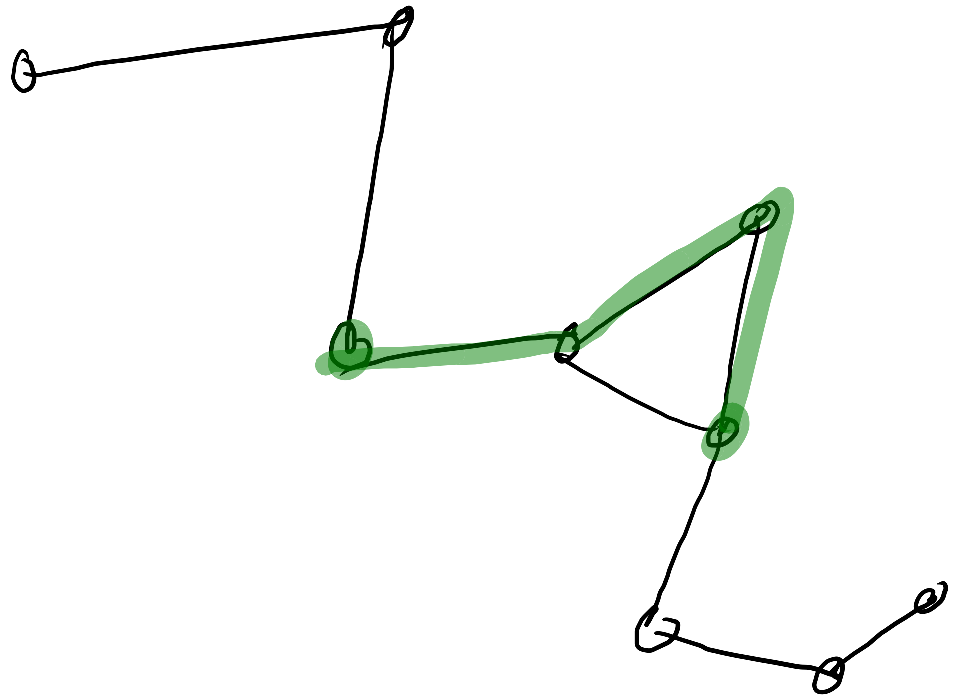
$e = \{2; 3\}$

$$C_2^5 = \binom{5}{2} = \frac{5!}{3!\,2!} = \frac{5\cdot 4}{2}$$

$$= \frac{5\cdot 4\cdot \cancel{3!}}{\cancel{3!}\,2!}$$

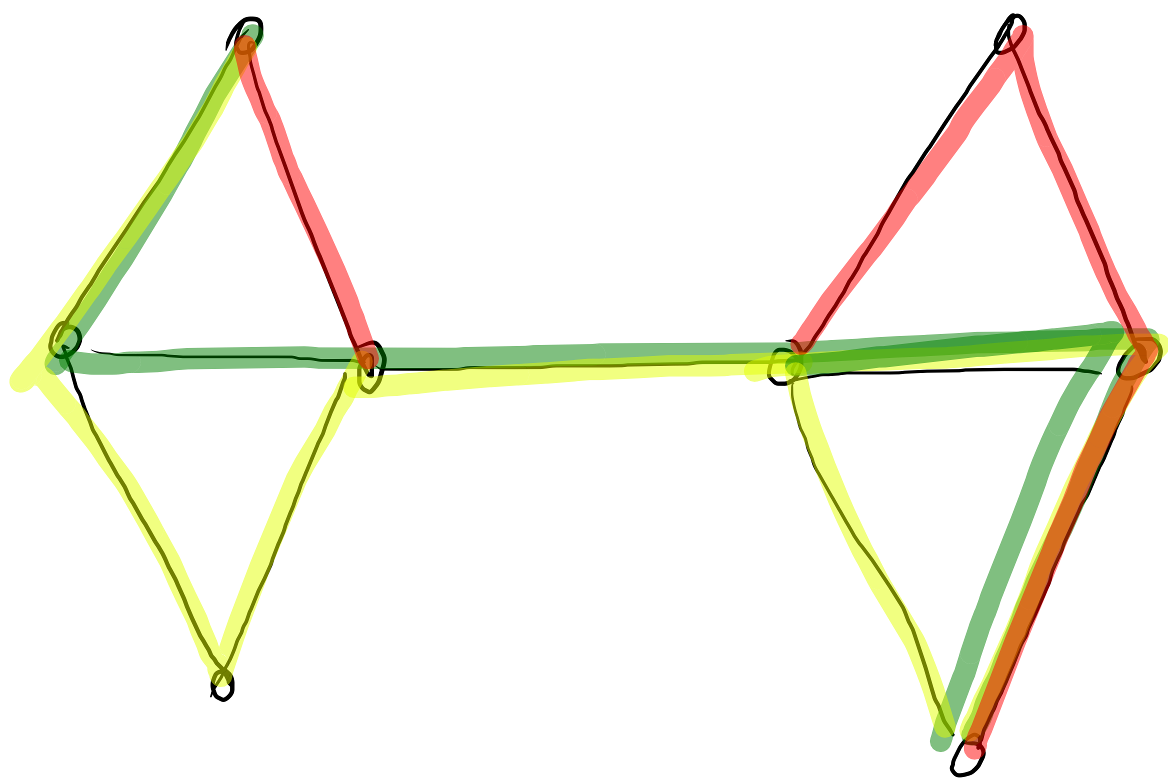
aretes de K_5 $= \dfrac{4\cdot 5}{2}$

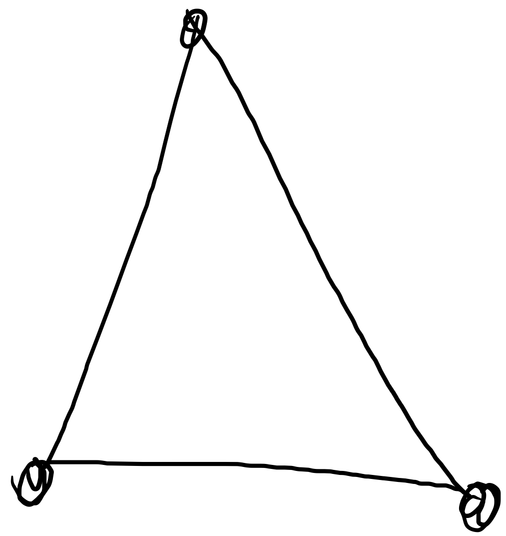
n	# graphes
1	1
2	2
3	4
4	11
5	34
6	156
7	1044
8	12 346
9	308 708

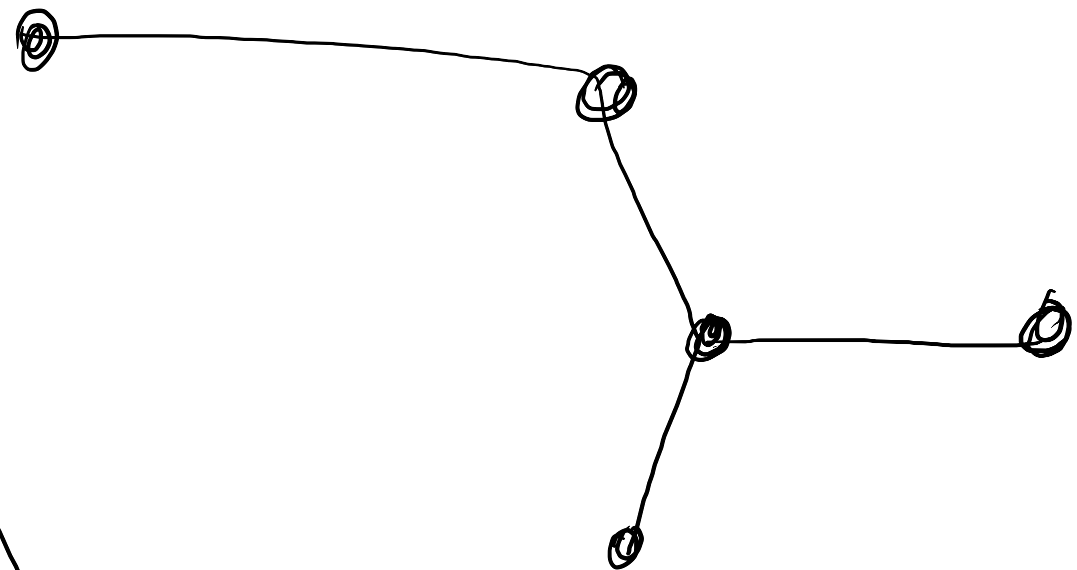


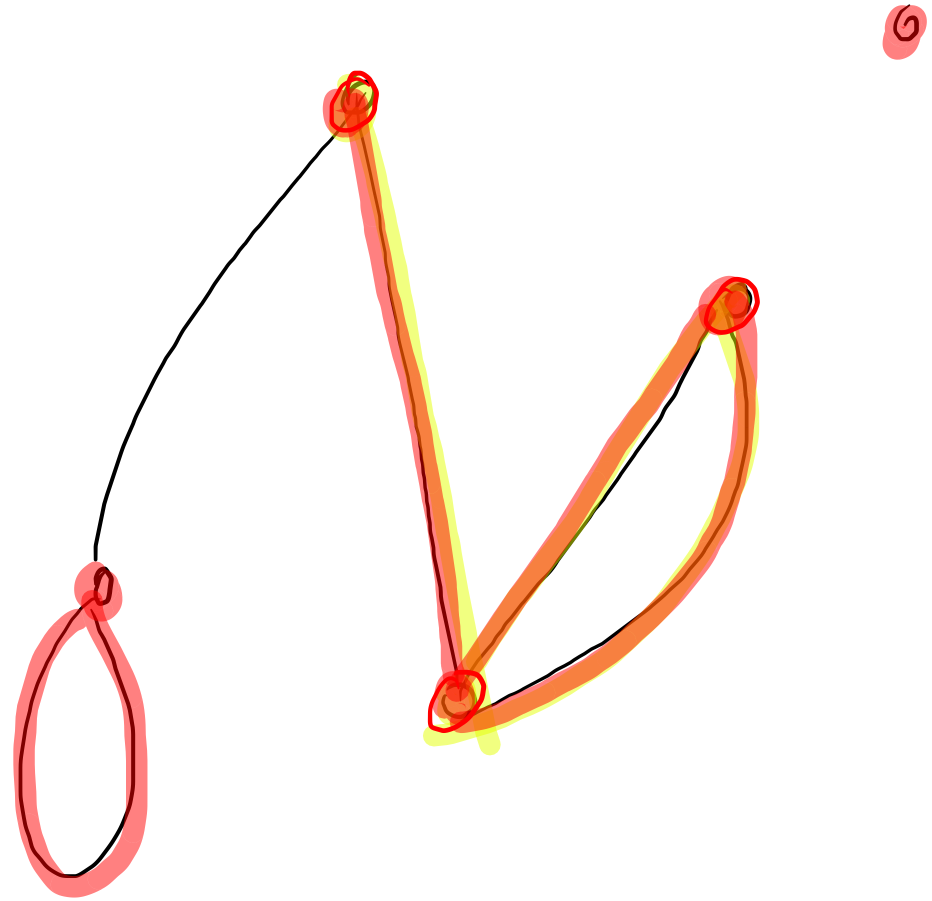
Connexe

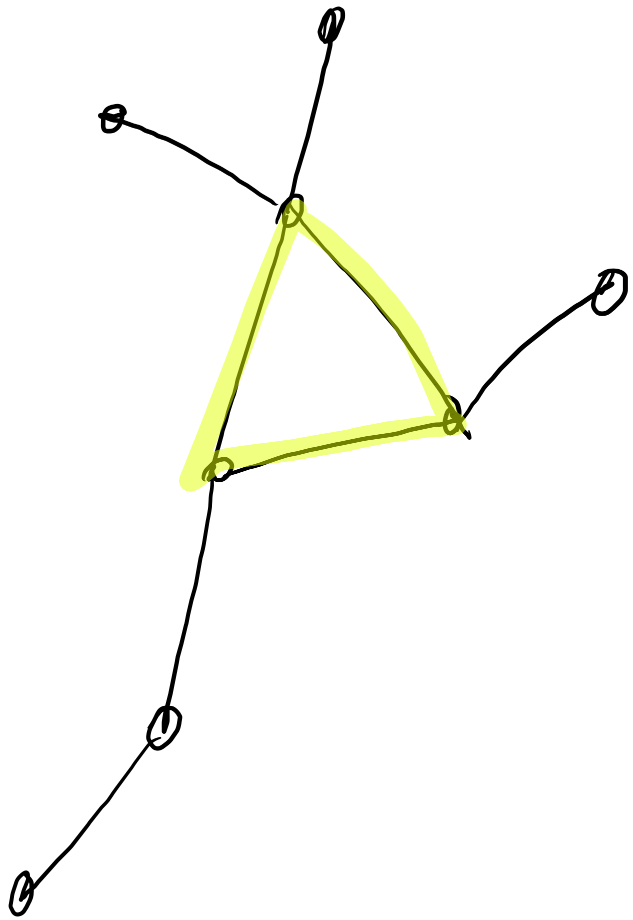
non connexe







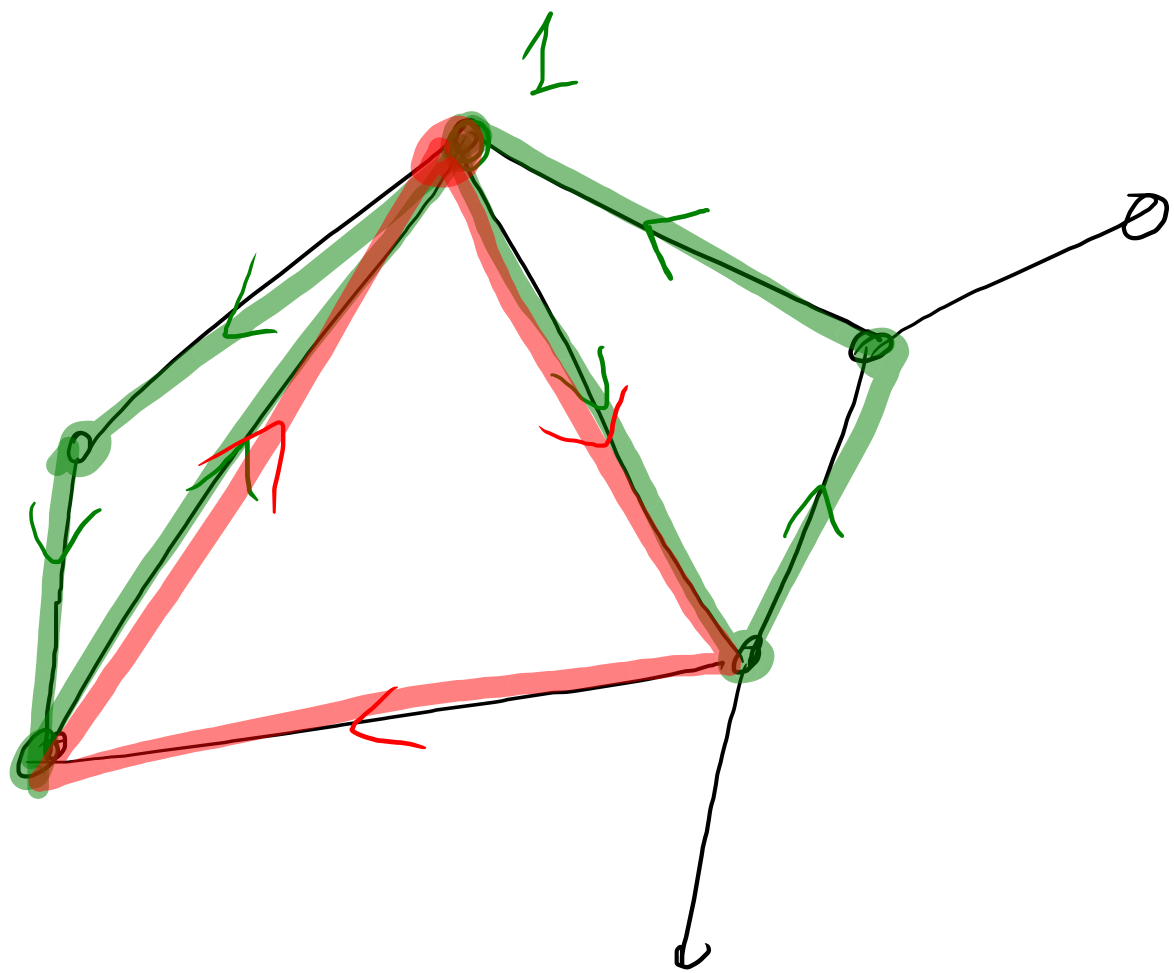




Cycle :

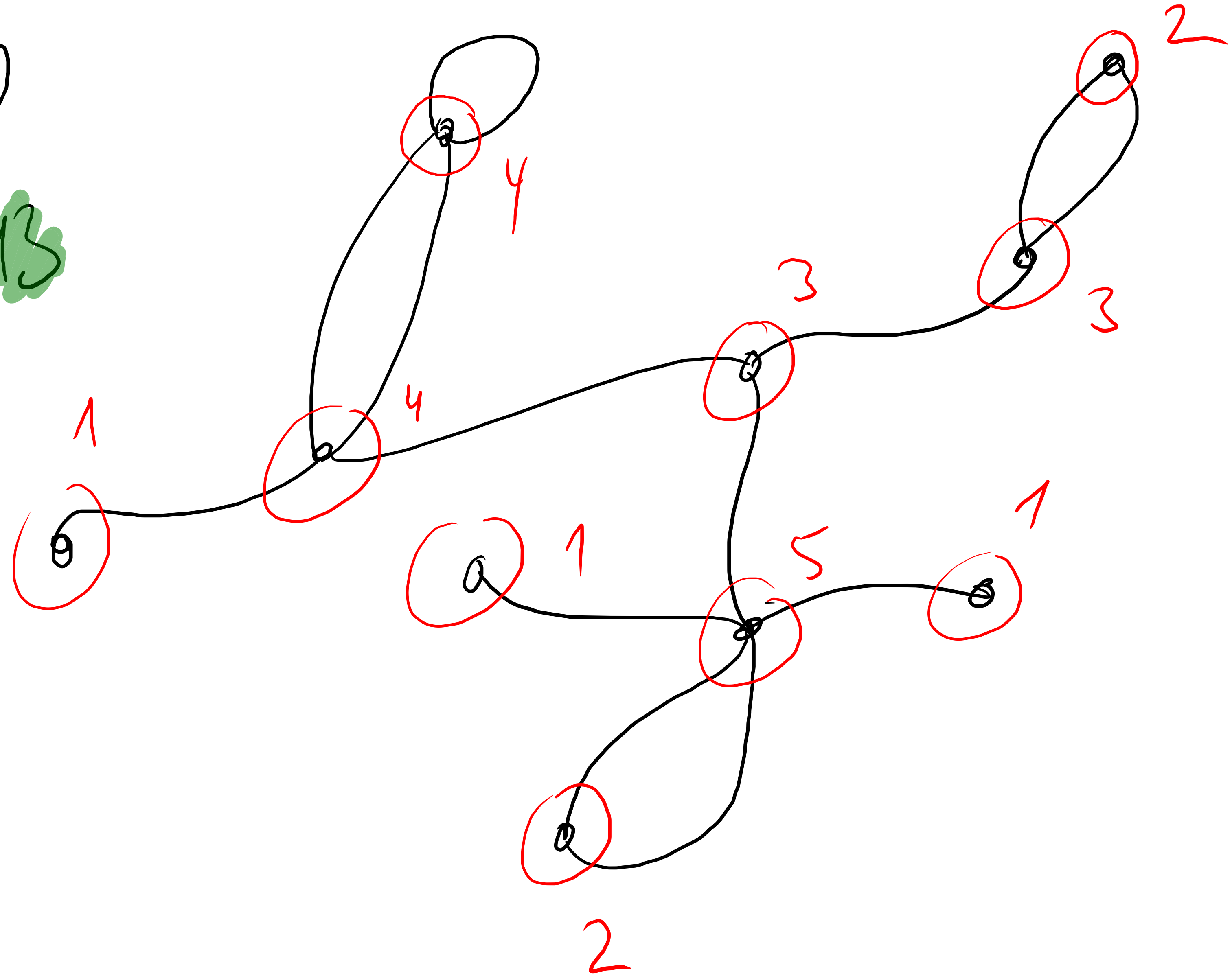
fermé

simple (pas 2 fois la même arête)



$\#X = 10$

$\#E = 13$



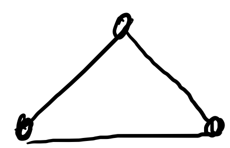
$1+4+4+3+3+2+1+5+1+2 = 26$

$\#$ sommets de degré impair $\equiv 0 \mod 2$

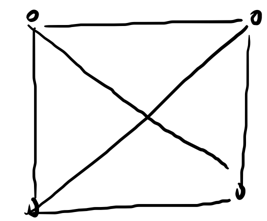
K_1

K_2

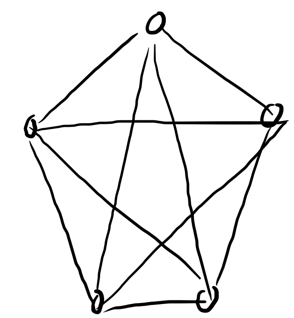
K_3



K_4



K_5



$$m = \binom{n}{2} = \frac{(n-1)\cdot n}{2}$$