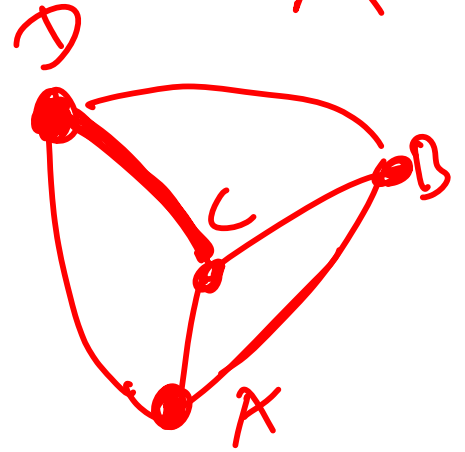
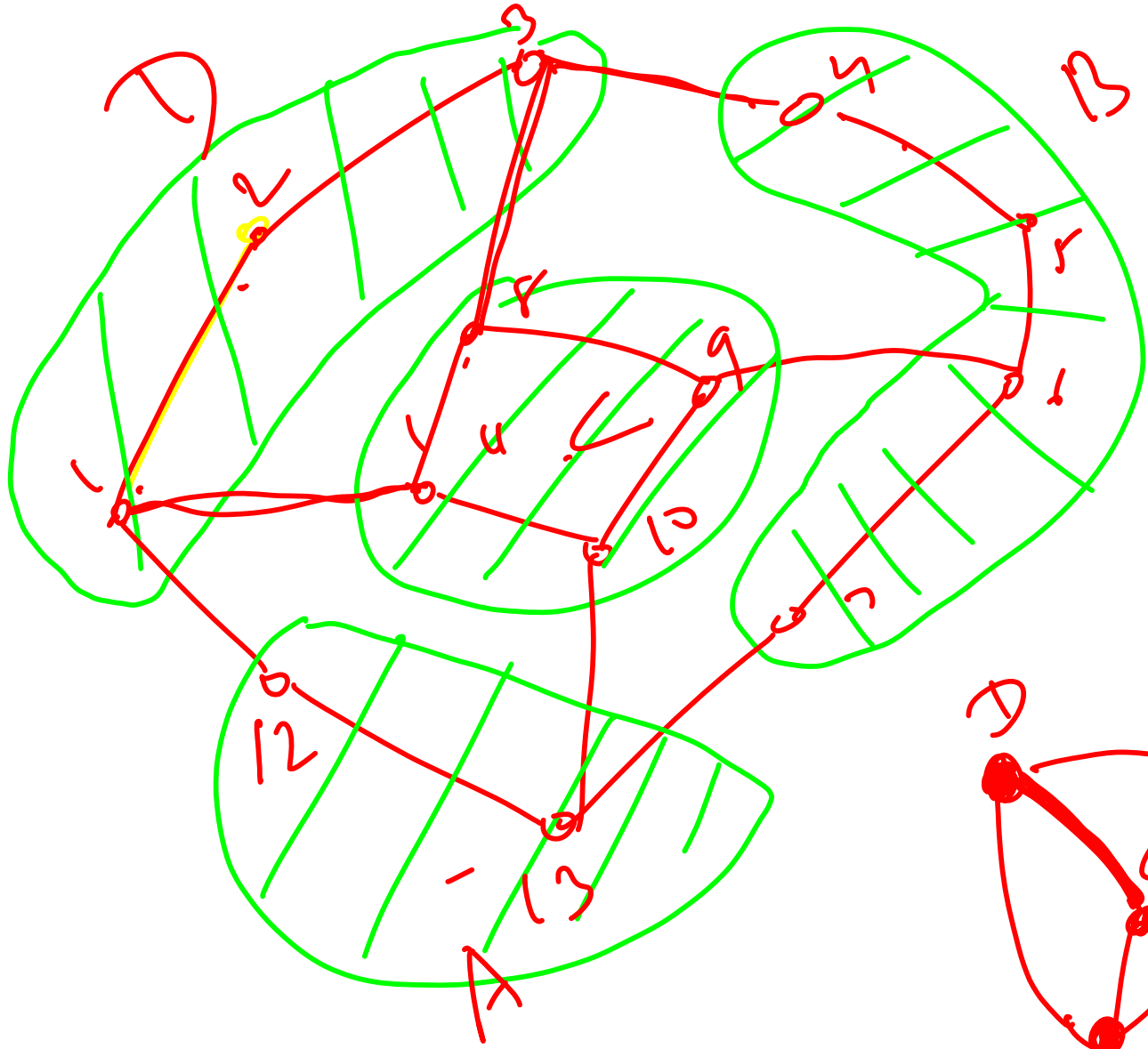
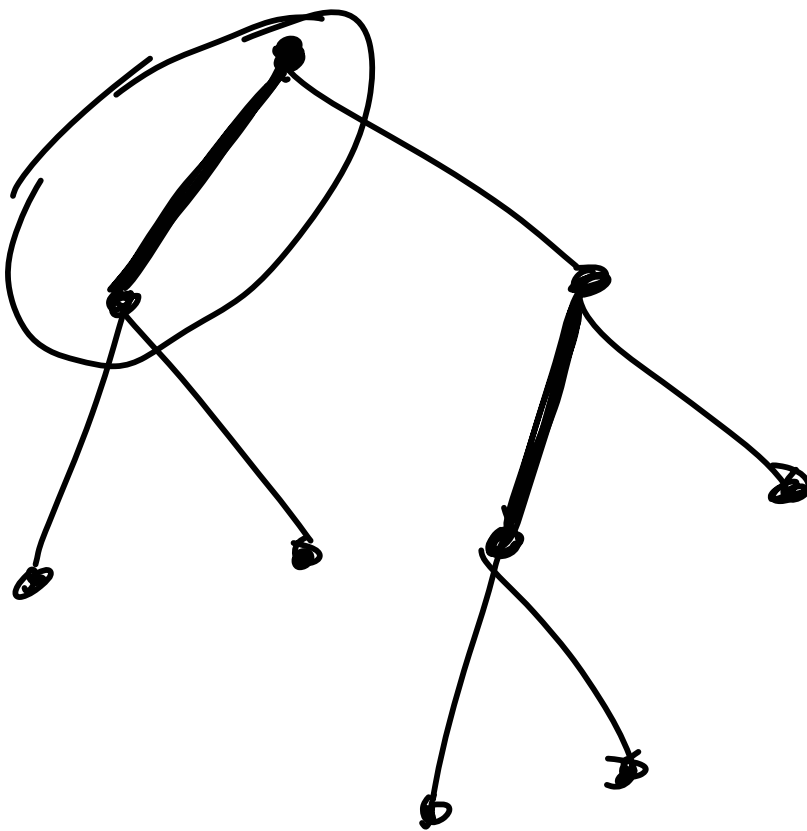


11 3x



$\gamma(G)$

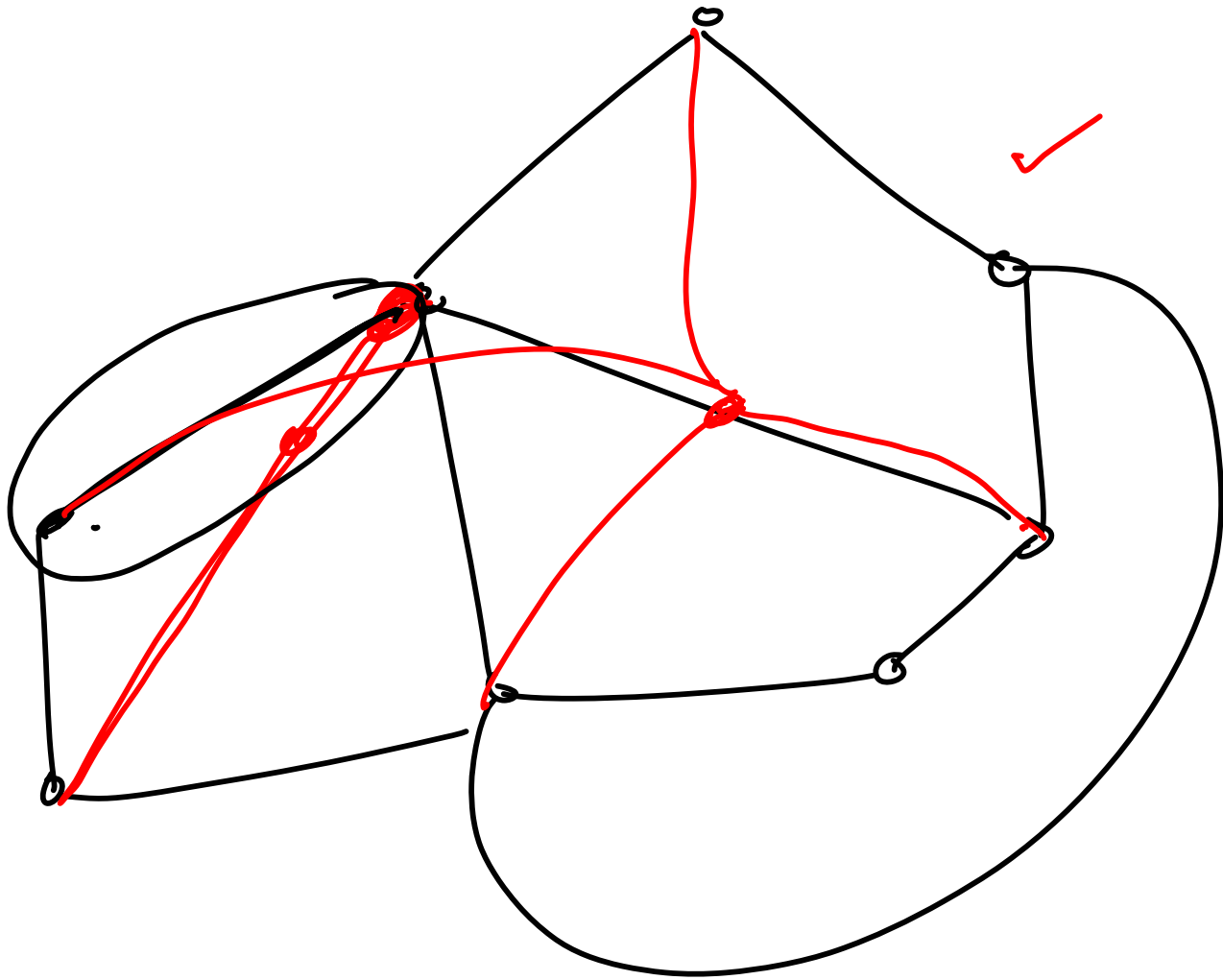
"Hadwiger  
number"



$K_2$

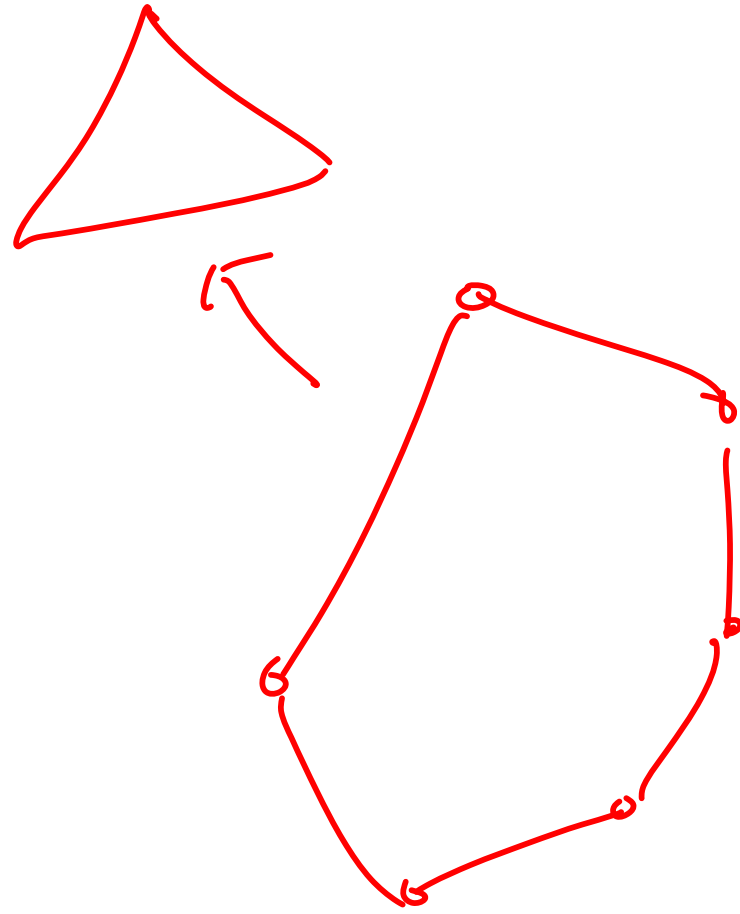
$K_3$

$$\gamma(T) = K_2$$



$$y(5) \leq \cancel{1.4} \quad \checkmark$$

$$K_5 \quad \checkmark$$



"m"

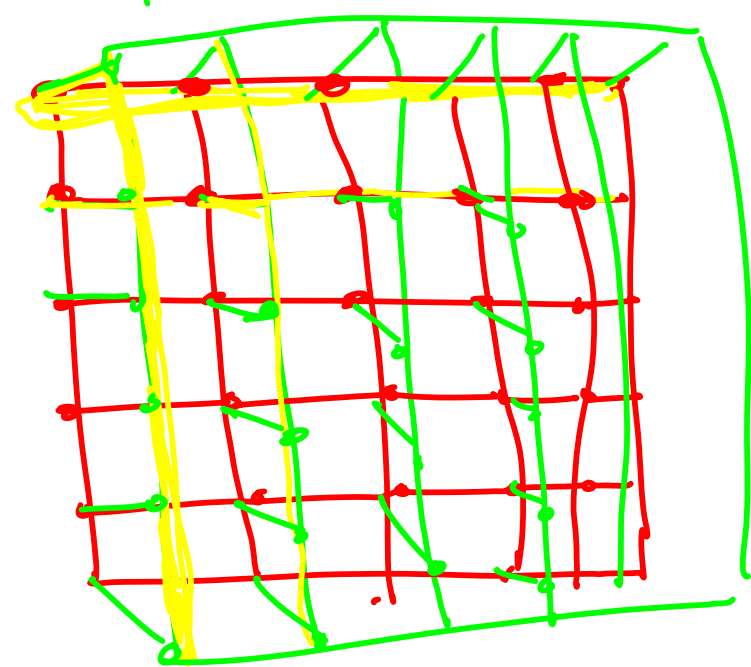
$K_t$

$$\frac{t(t-1)}{2} \leq m$$

$$\checkmark t(t-1) \leq 2m \checkmark$$

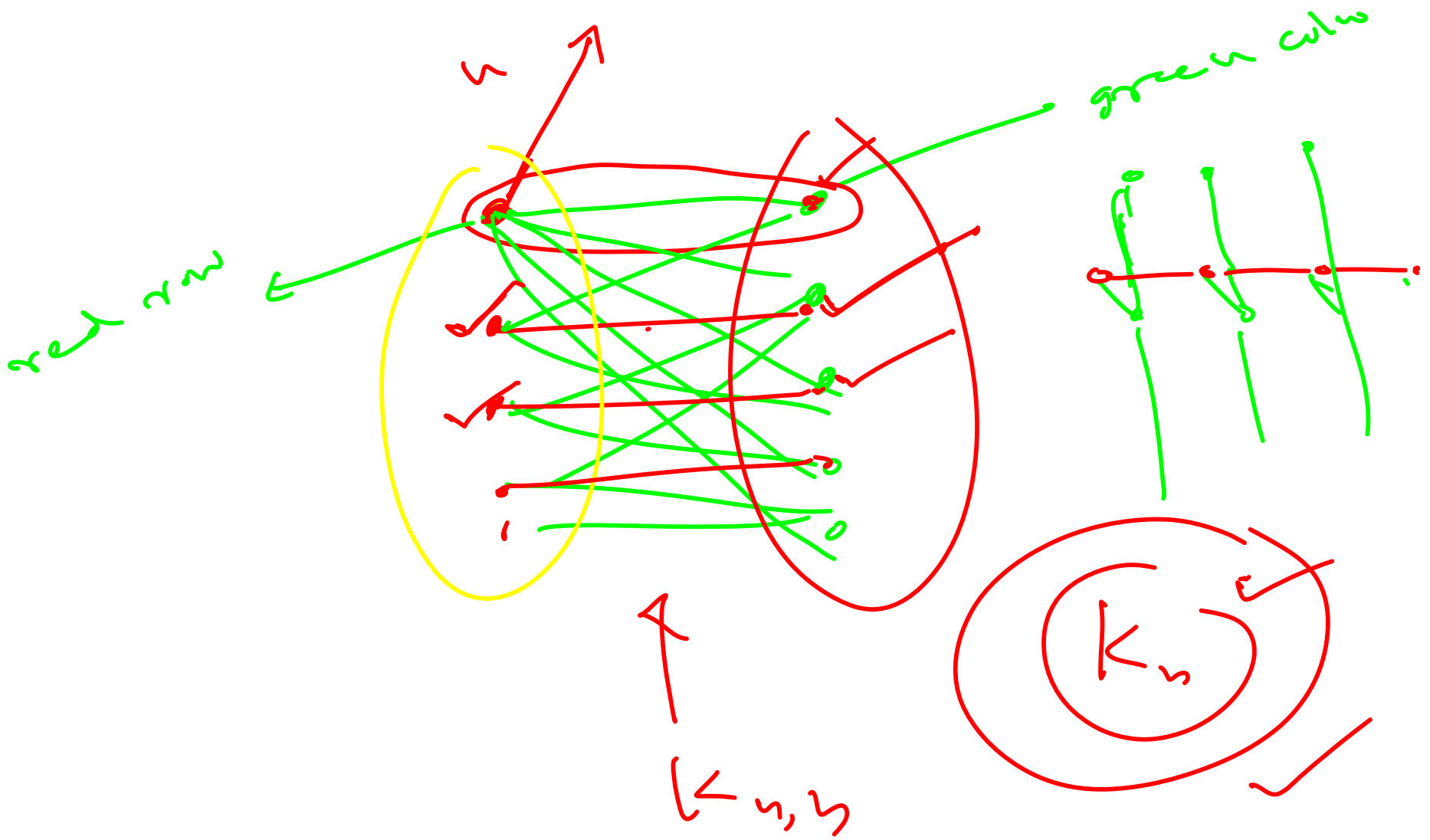
$$P_n \square P_n \square K_2$$

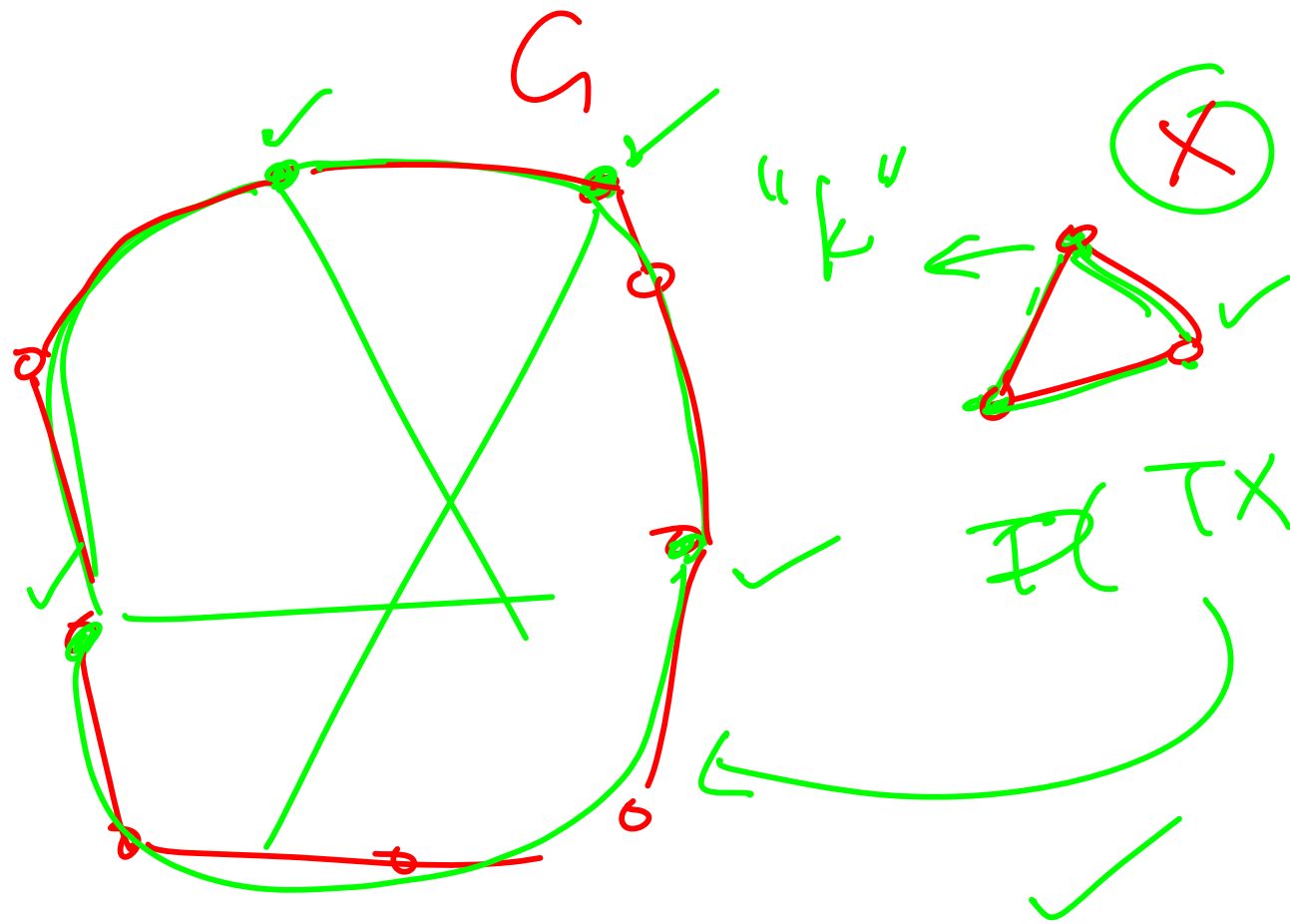
$K_n$  minor

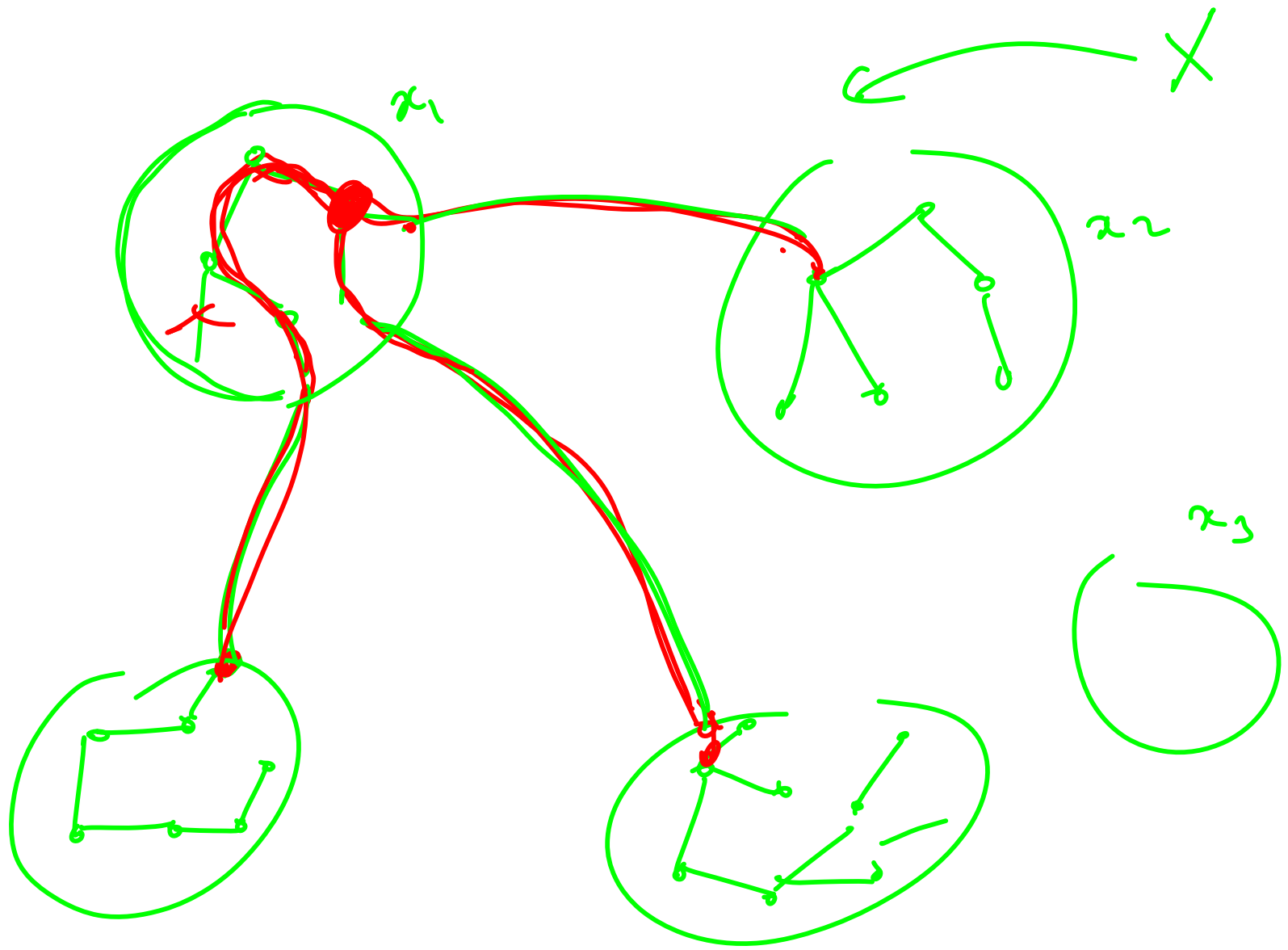


$n$ -branches  
set

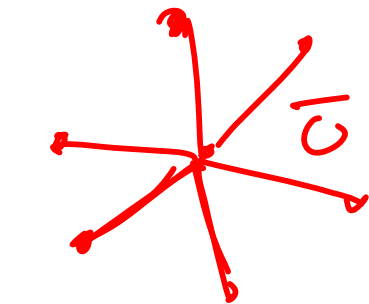








$2^d$



$[0, 1, 0, \dots, \dots, \dots]$  ✓

$H_d \leftarrow (K_n)$

$[0, 0, 0, 0, \dots, 0]$  ✓

$[1, 0, 0, \dots, \dots]$  ✓

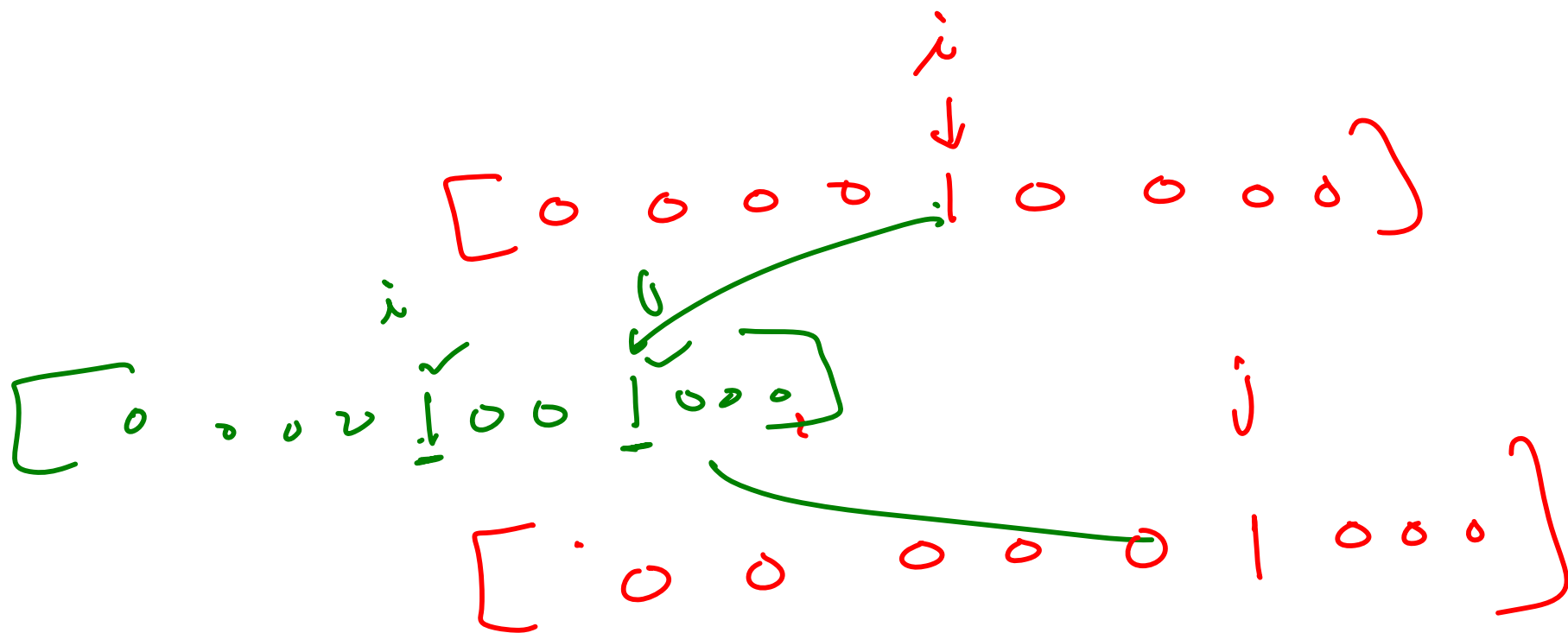
$[0, 1, 0, 0, \dots, \dots]$  ✓

$[ \dots, \dots, \dots, 1 ]$  ✓

$n \leq d$

$n-1 \leq d$

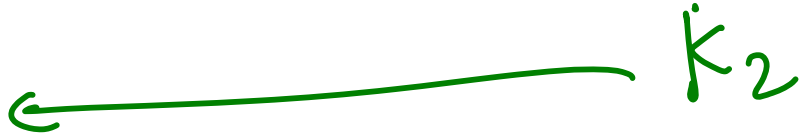
$d+1$  ✓



$\leftarrow_{d+1} \checkmark$

~~$r=1$~~

$r=2$

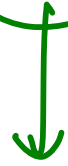


$r=3$



$K_3$

✓

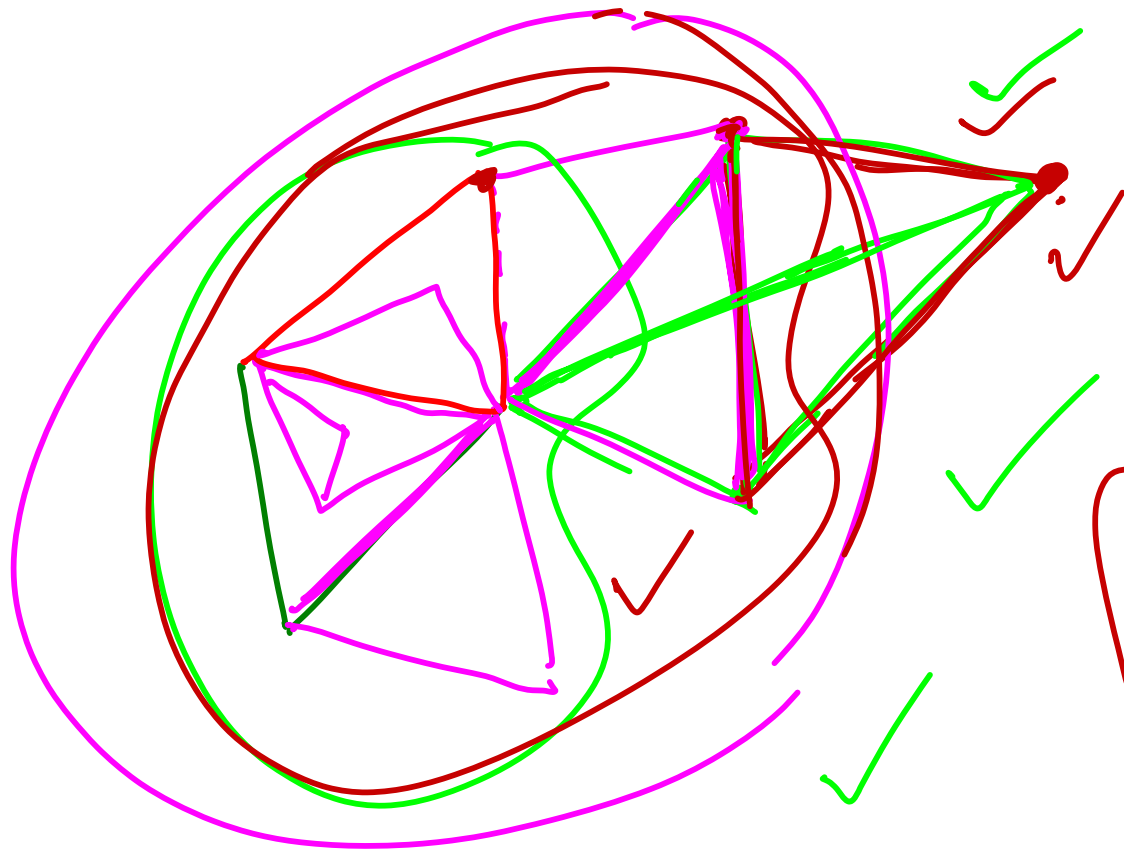


~~$r=2$~~



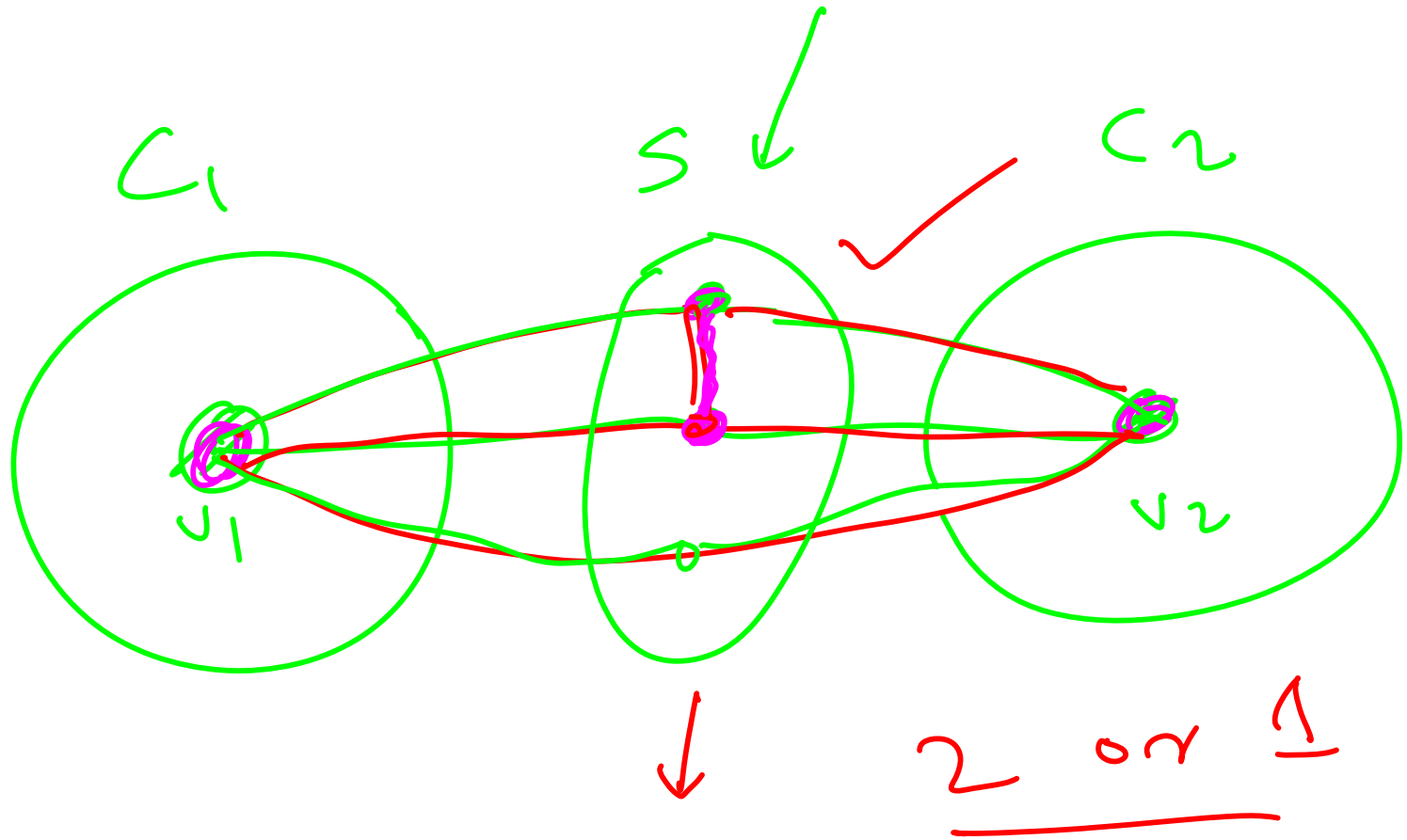
$K_4$

✓✓

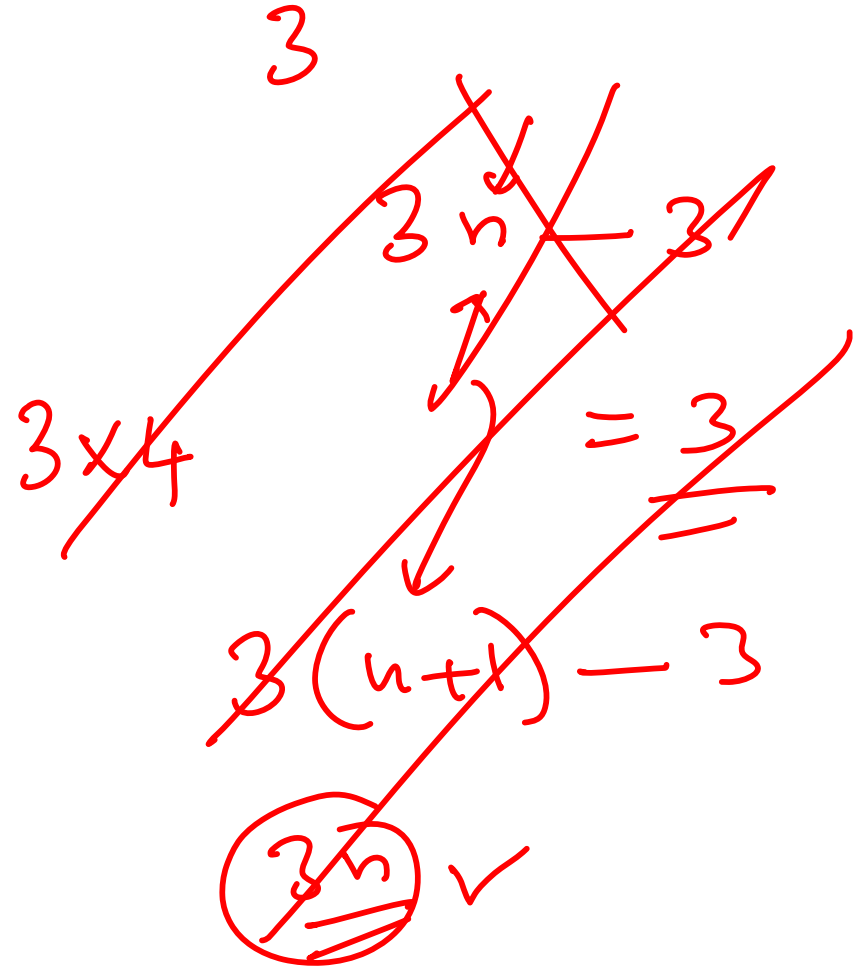
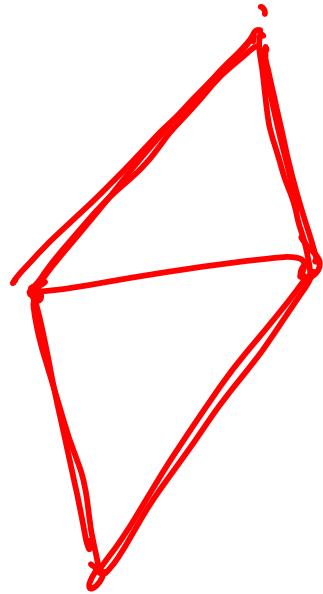


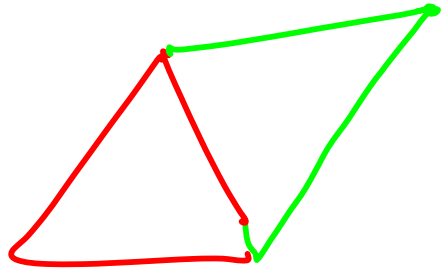
$K_4$

$$\Delta(K_4) \leq 3$$







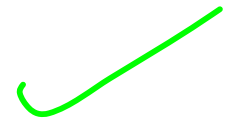


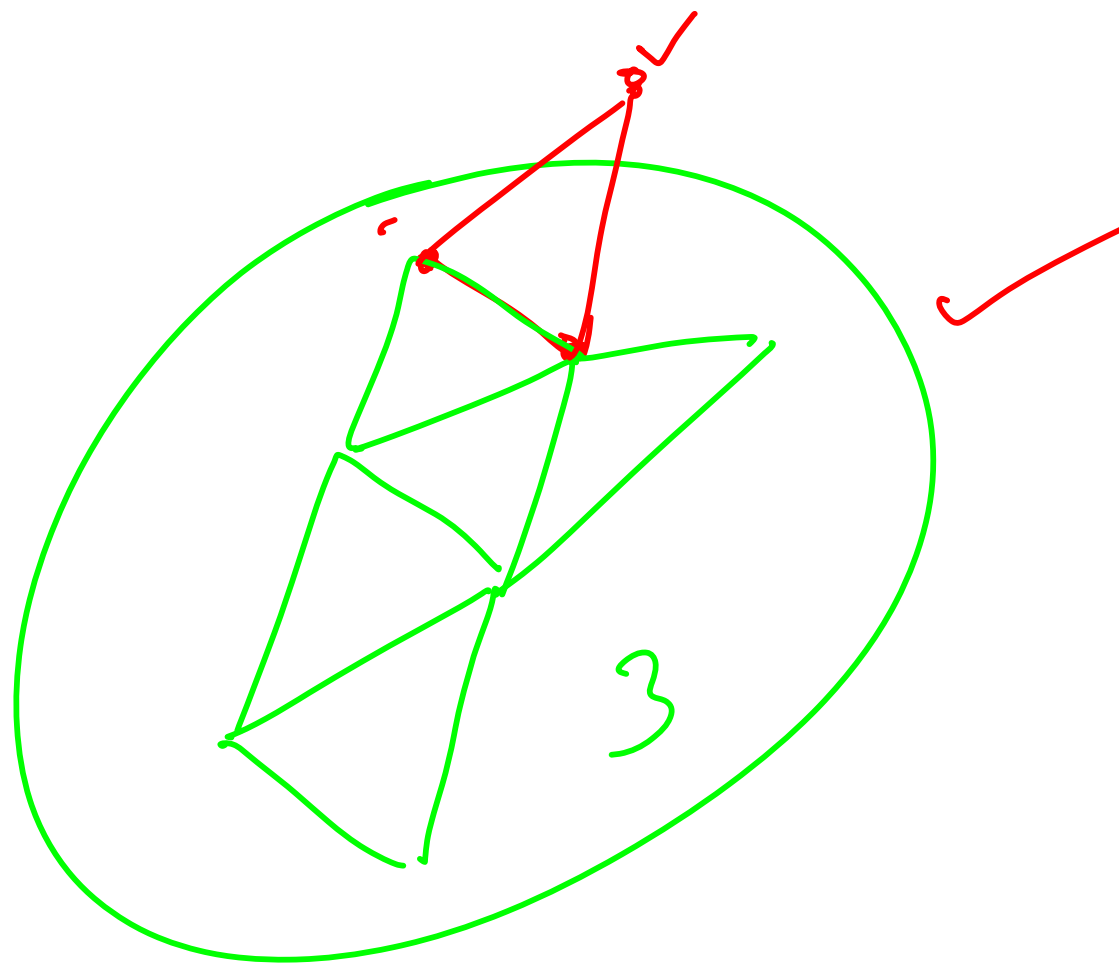
$$2n - 3$$

$$n = 3$$

$$6 - 3 = 3$$

$$2(n+1) - 3$$





3 are

