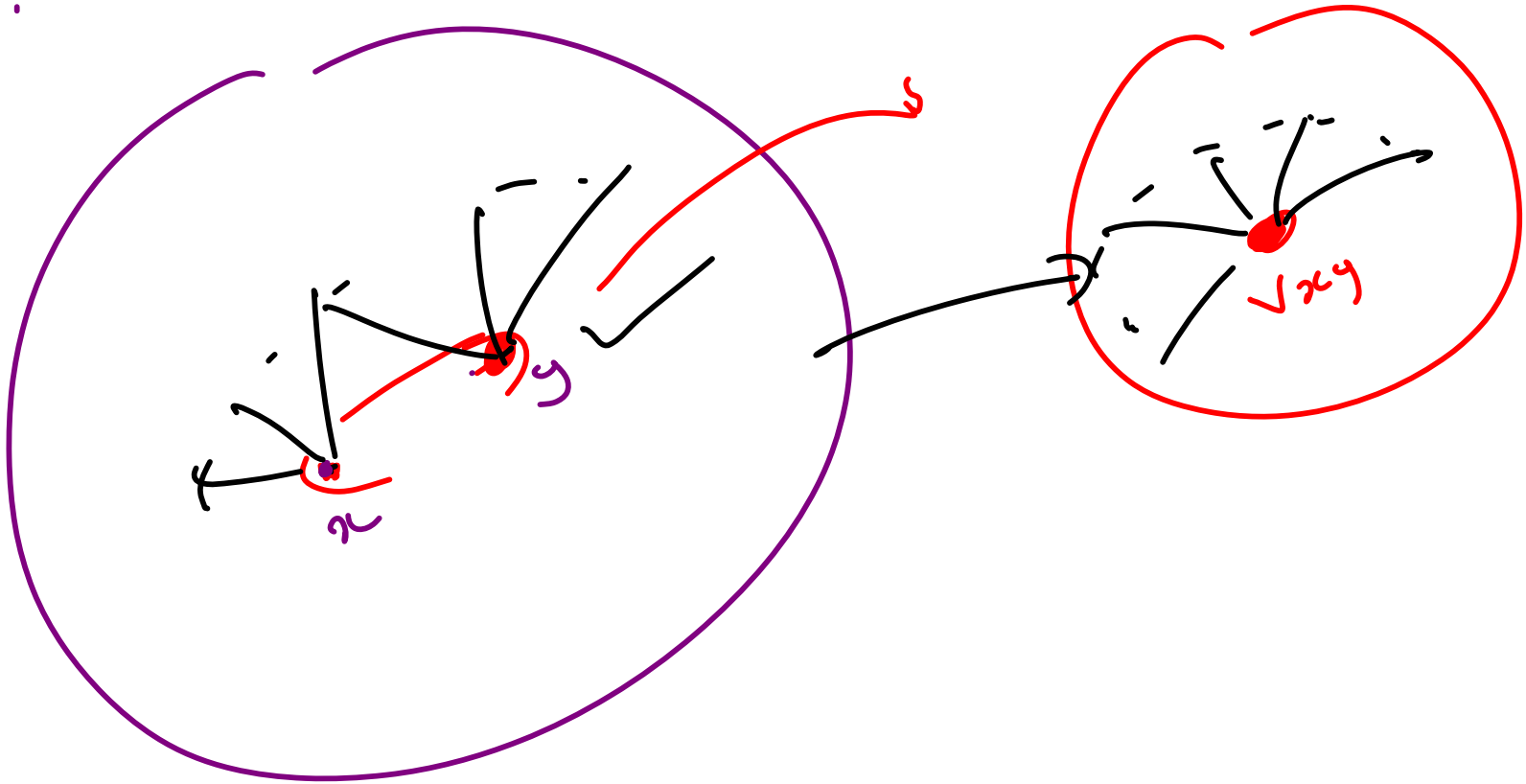
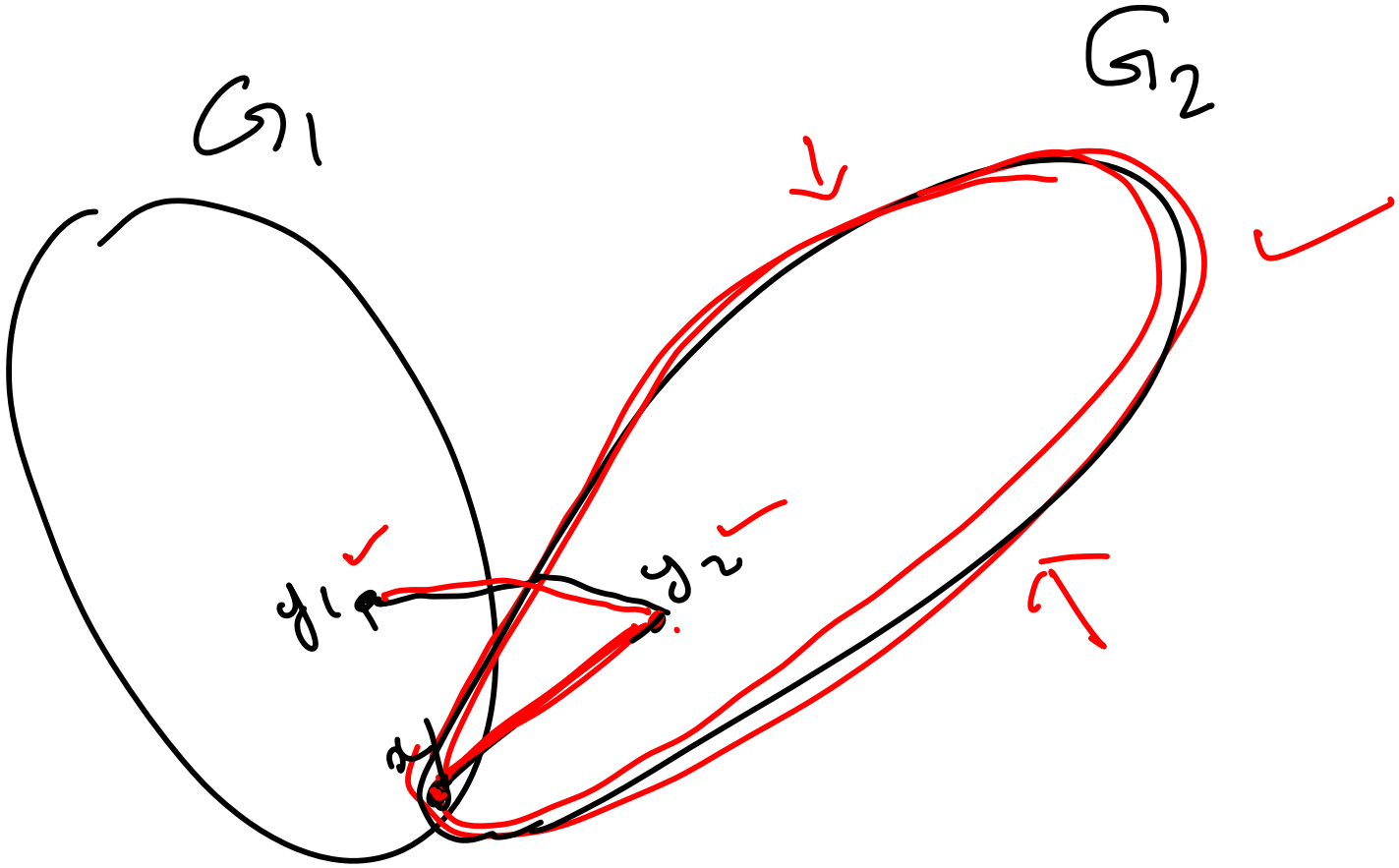
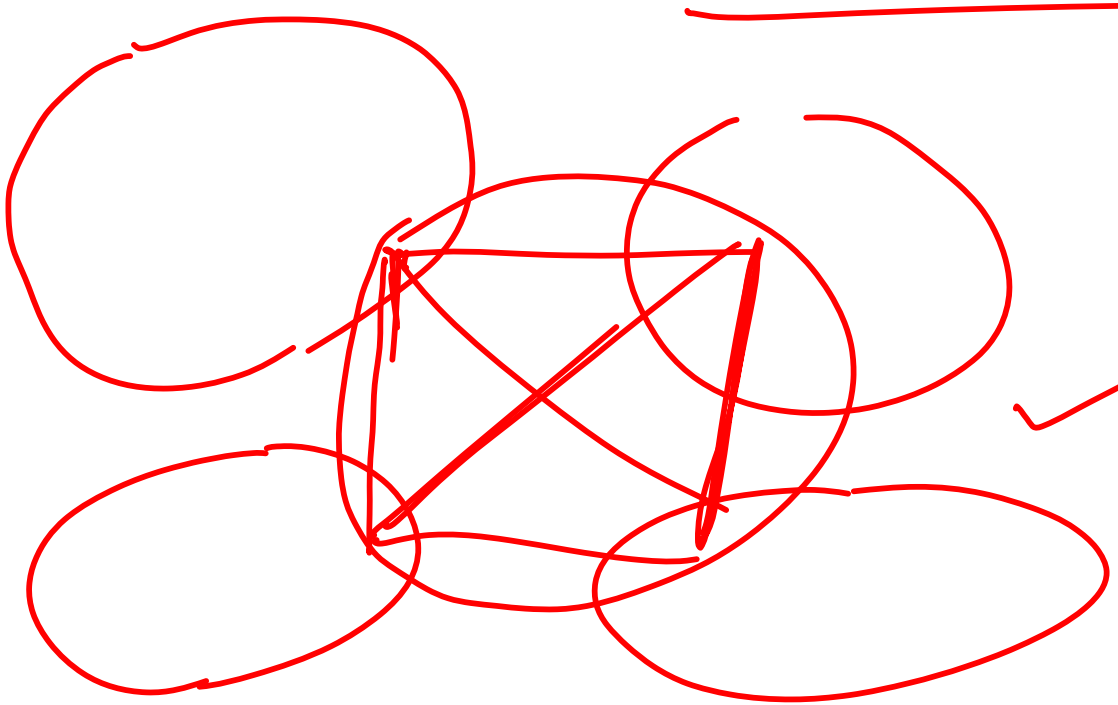

x
y
xy


G_1
G_2
y_1
y_2
x

If $\chi(G) \geq k$ then

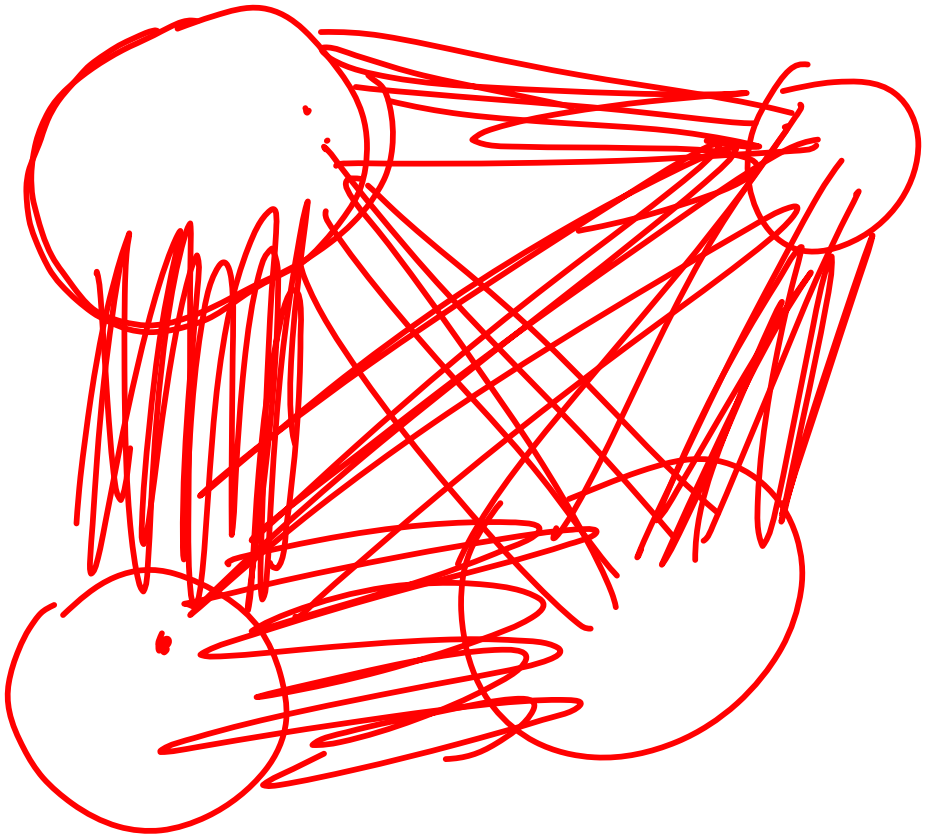
Edge maximal

G is complete $\overset{t}{k}$-partite graph ?



$t \geq k$

$V \times V$



$(u,v) \in R$

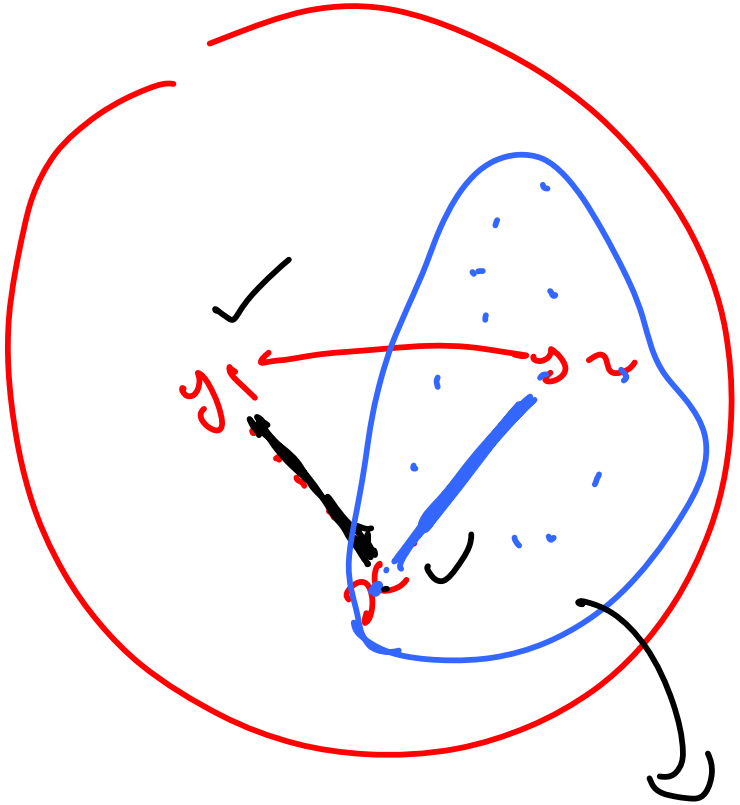
if u is not adjacent to v.

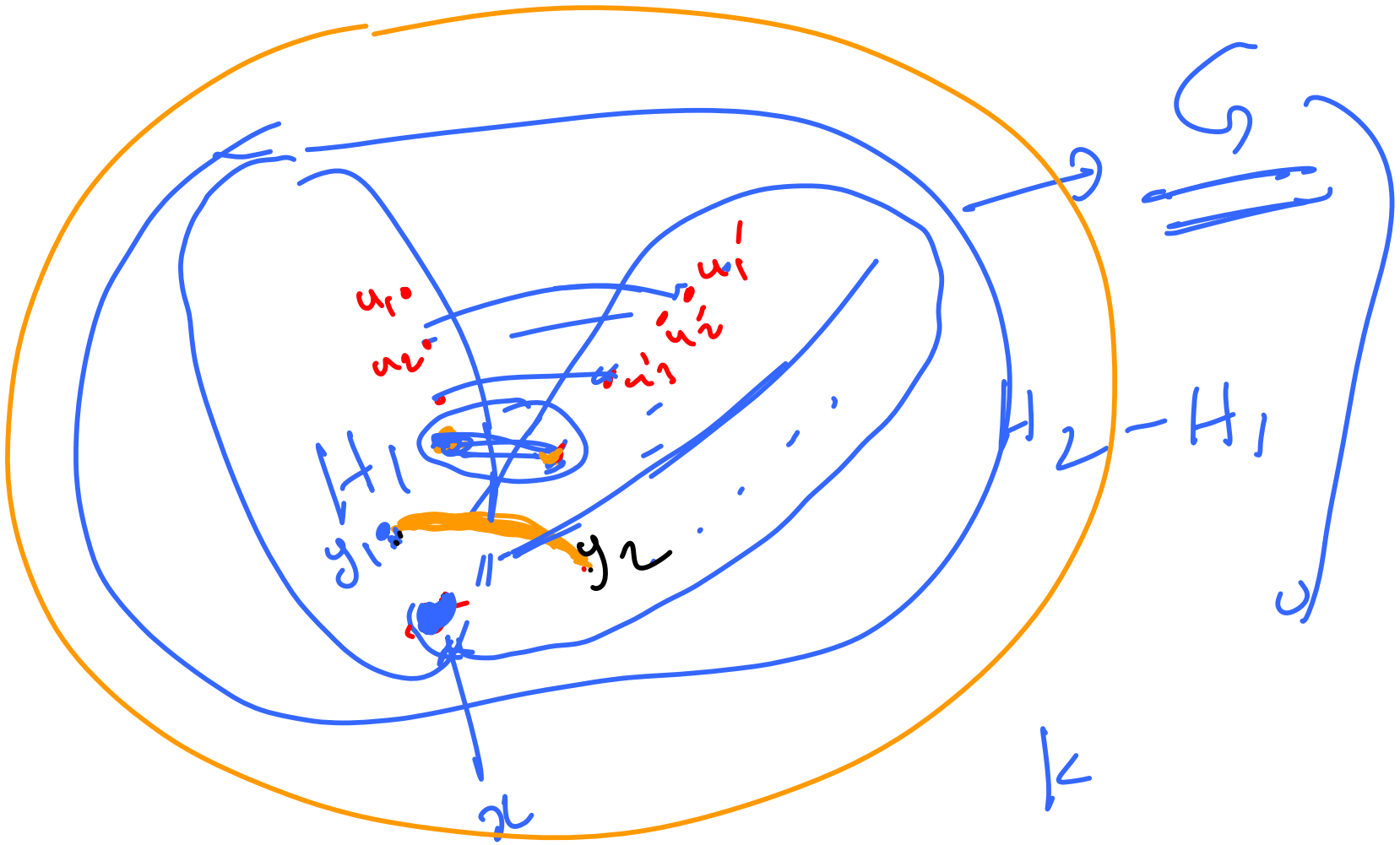
$(y_1, x) \in R$ $\quad (y_1, x) \notin E(G)$

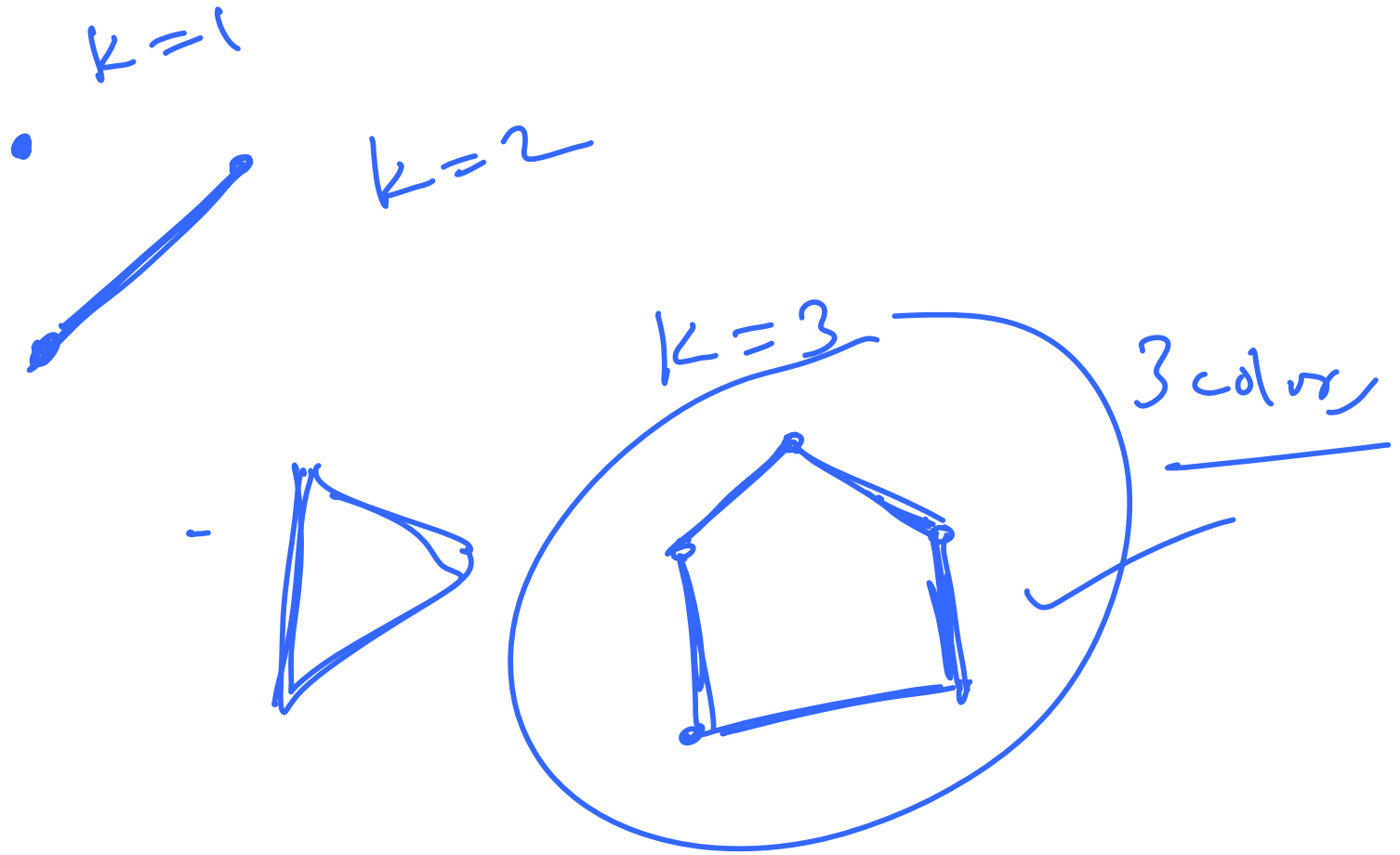
$(x, y_2) \in R$ $\quad (x, y_2) \notin E(G)$

but $(y_1, y_2) \notin R$ $\quad (y_1, y_2) \in E(G)$

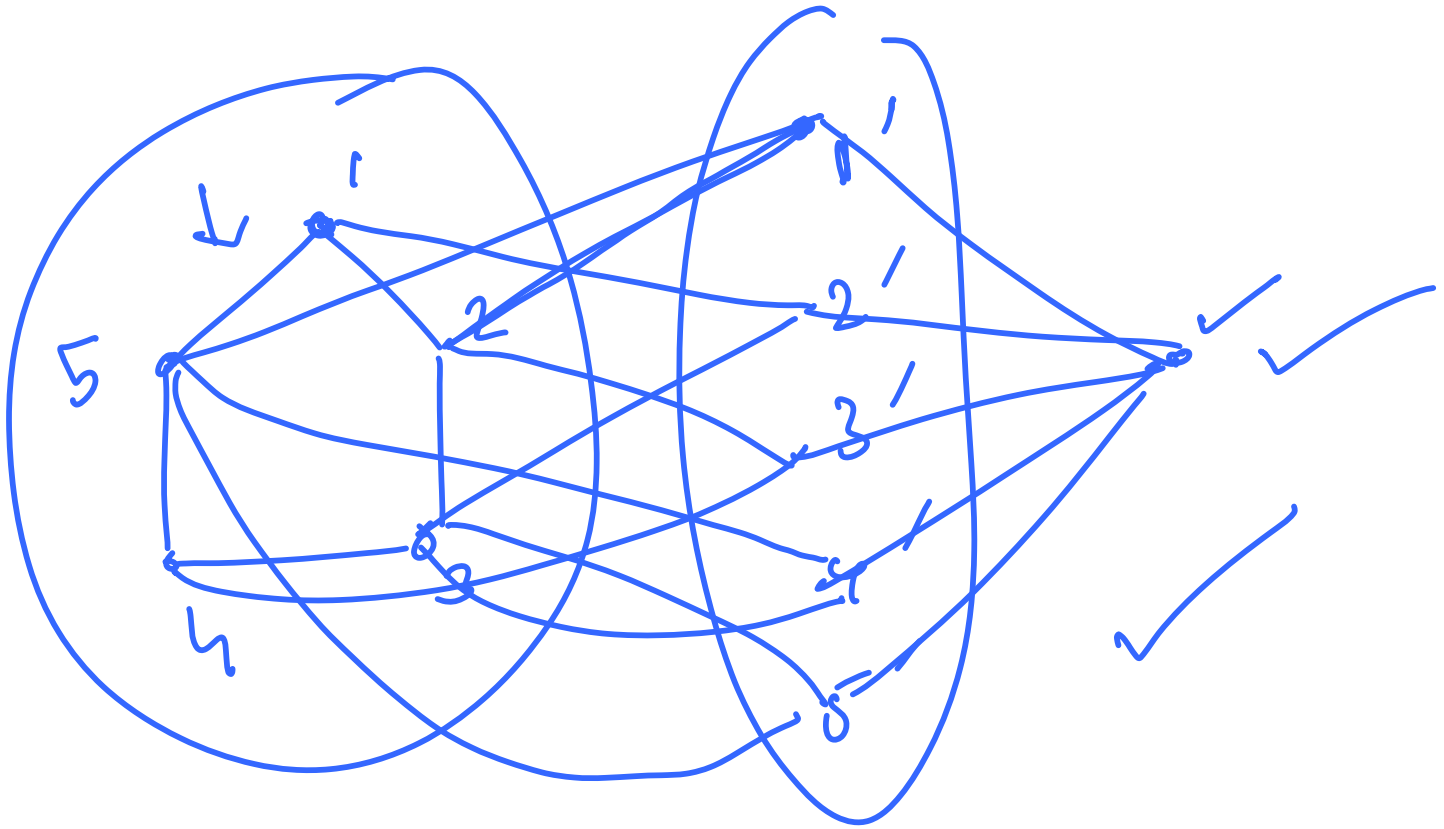
Edge maximal



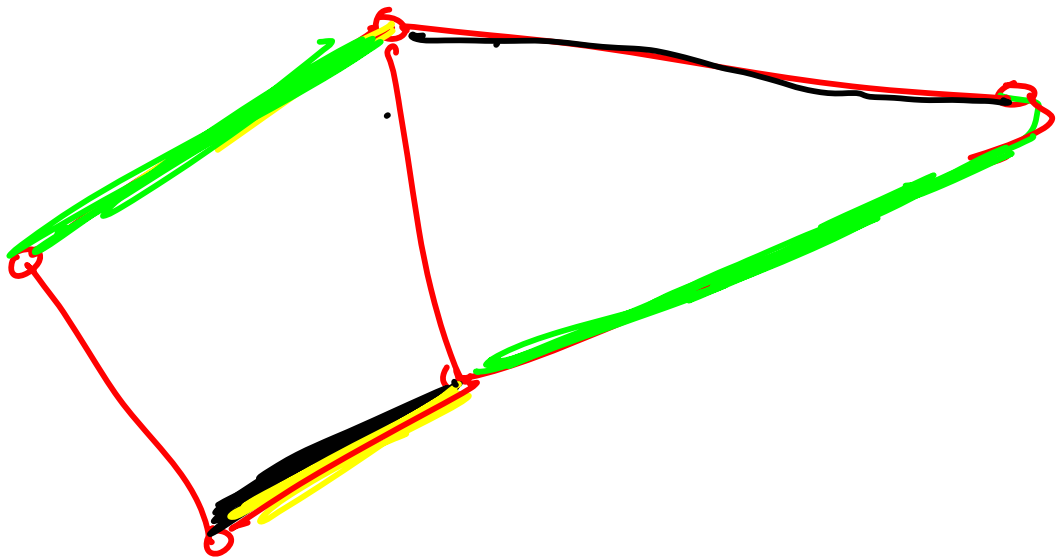

H1
y1
y2
H2 − H1
K

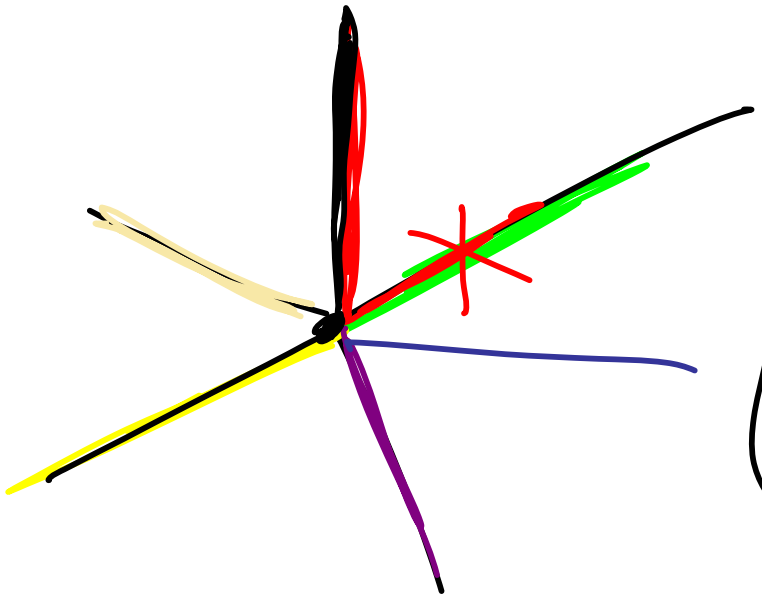

k=1
k=2
k=3
3 colors

$\chi(G) \geq k+1$ "k"



Edge coloring

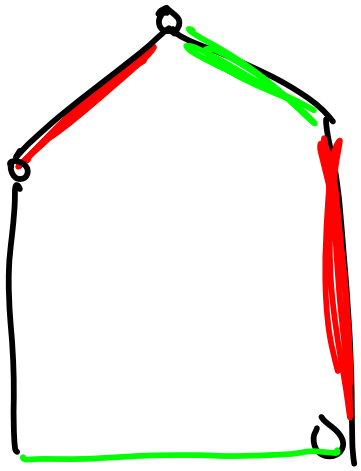




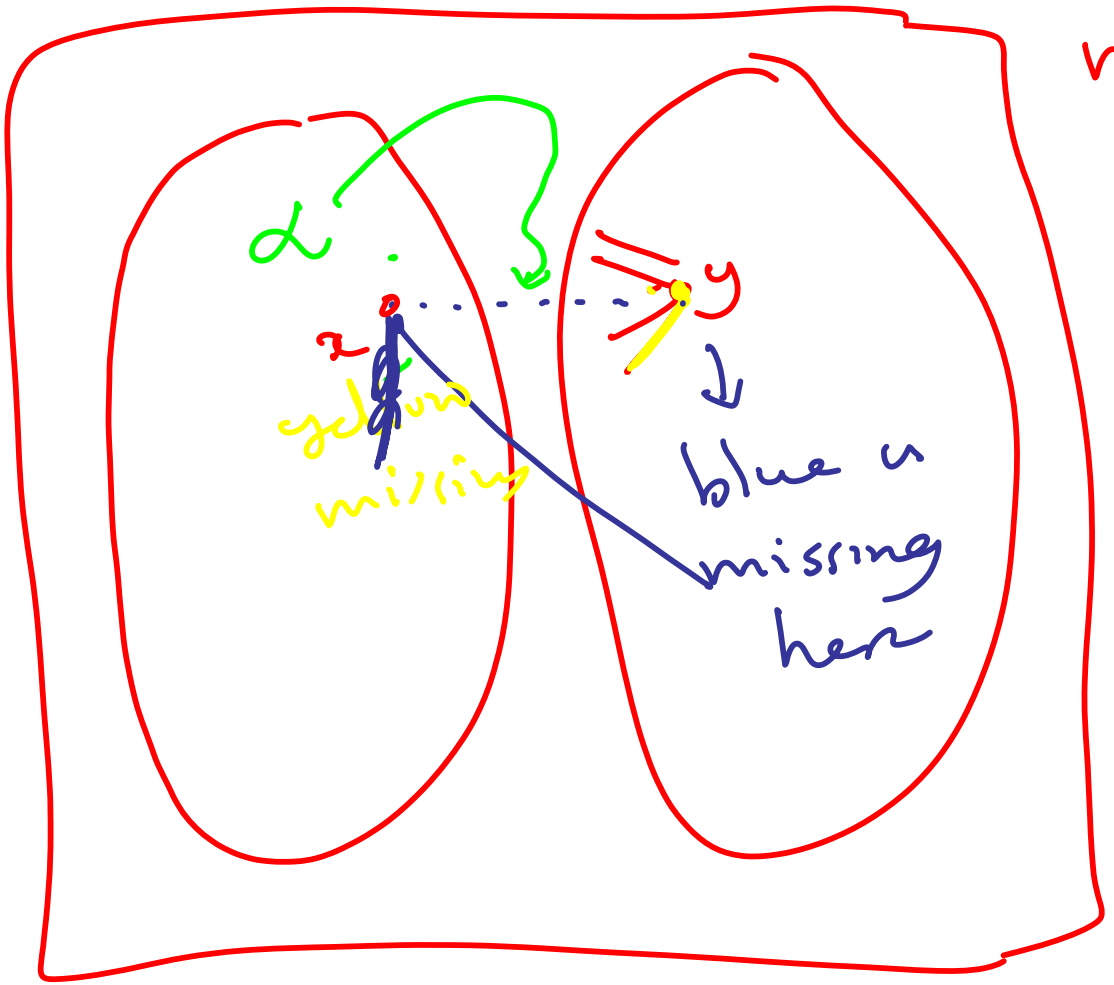
"$\triangle$" $\leq \chi'(G)$

$$\Delta \leq \chi'(G) \leq \Delta + 1$$

Vizing's theorem



3 colors required but $\Delta = 2$

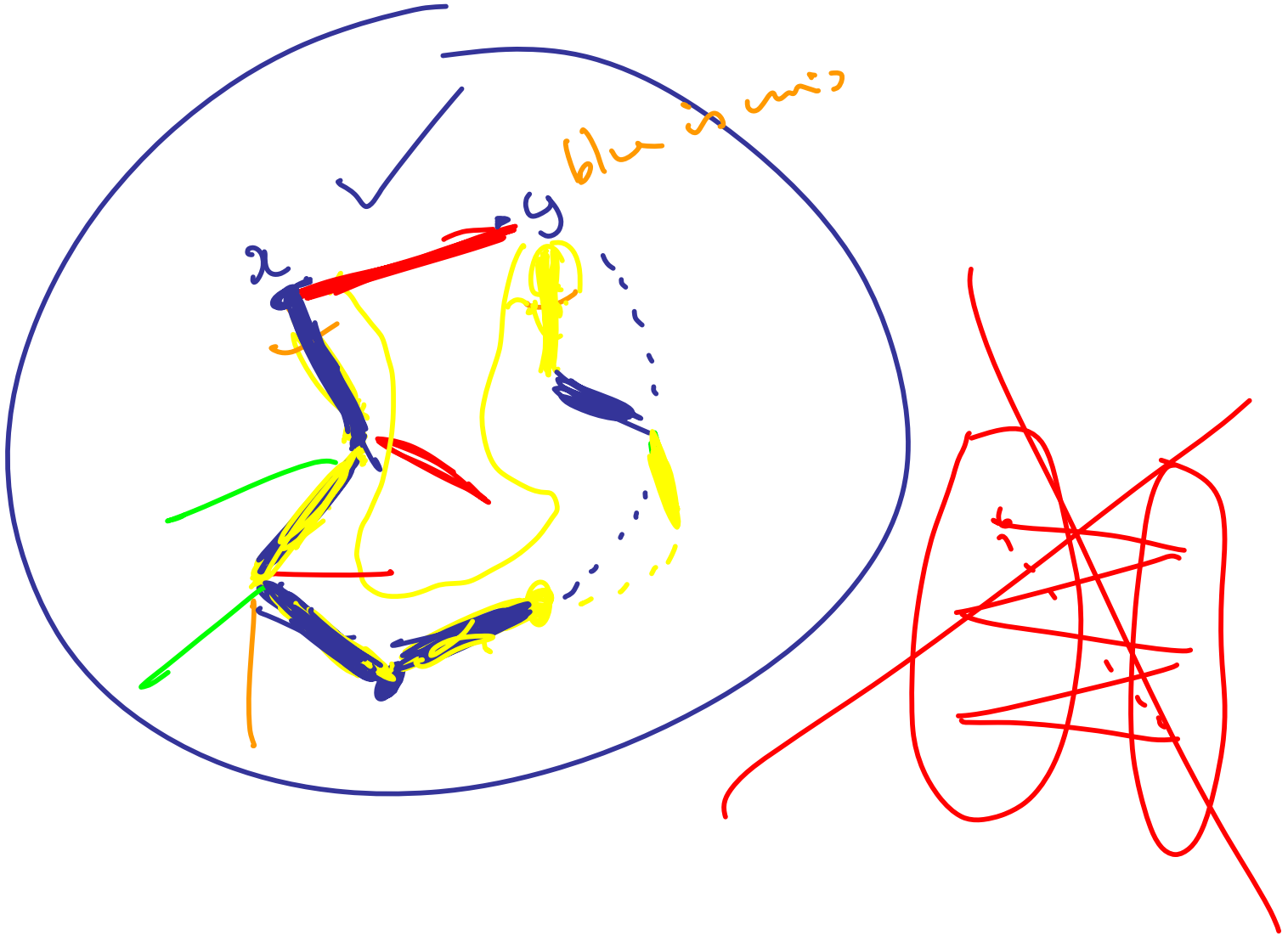


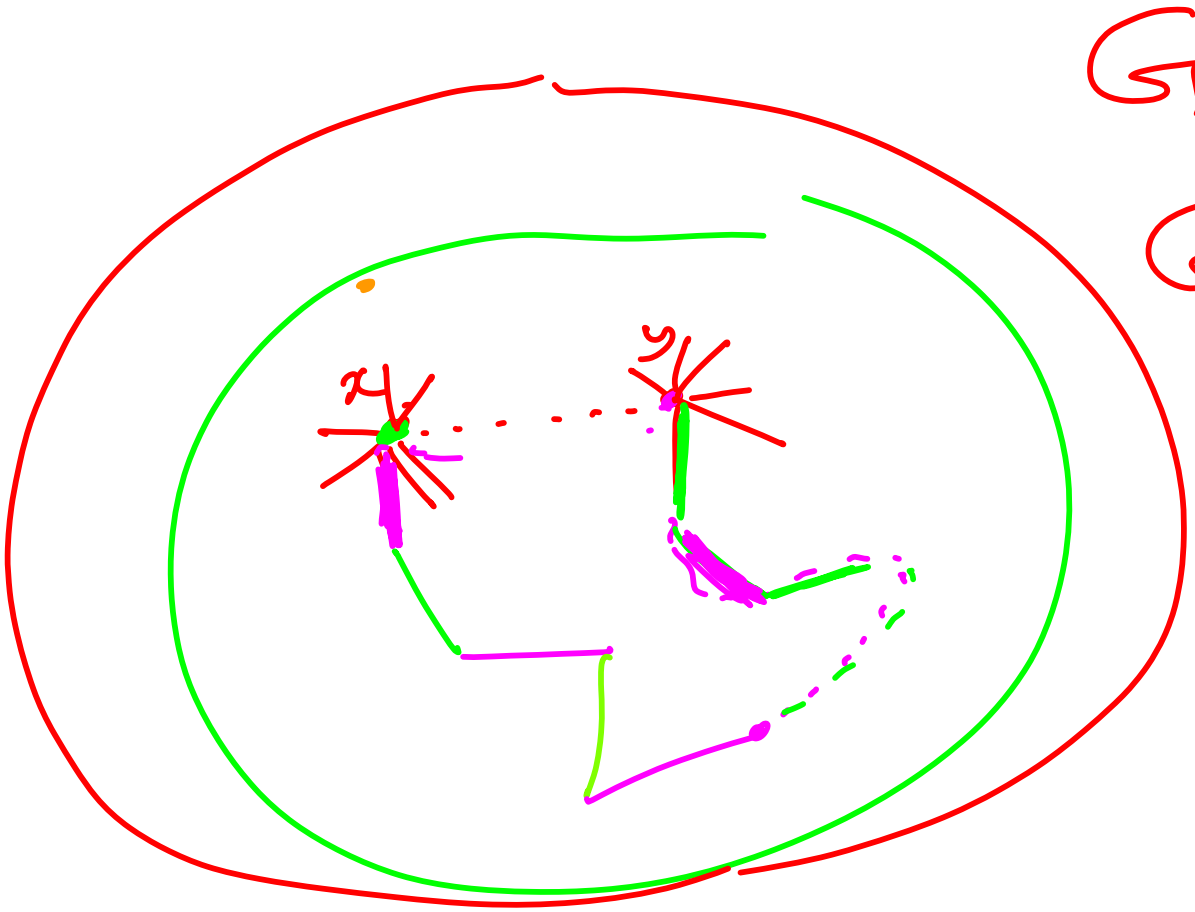
m

Δ in $G-e$

$d(x) \leq \Delta - 1$

$d(y) \leq \Delta - 1$

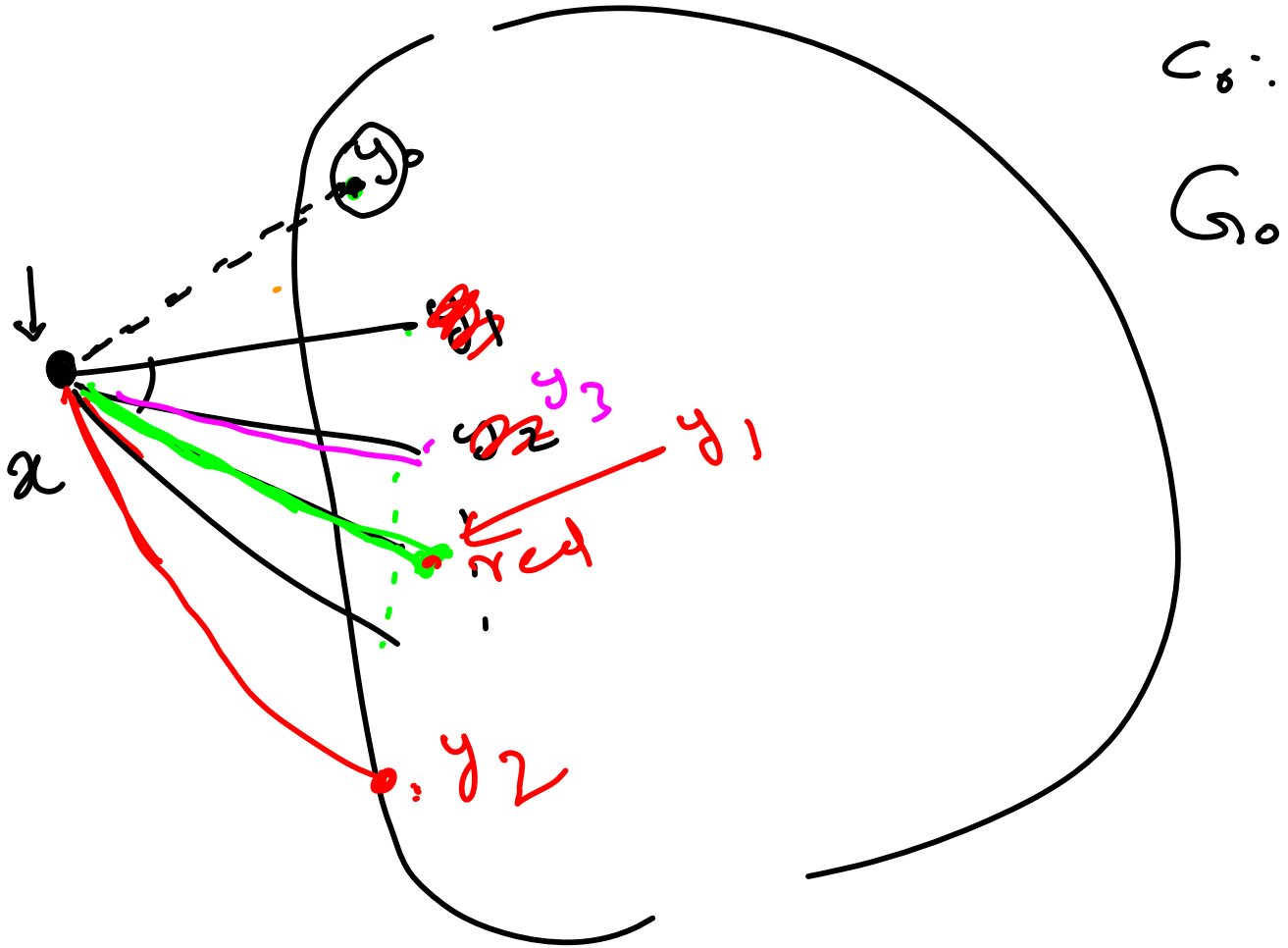

x
y

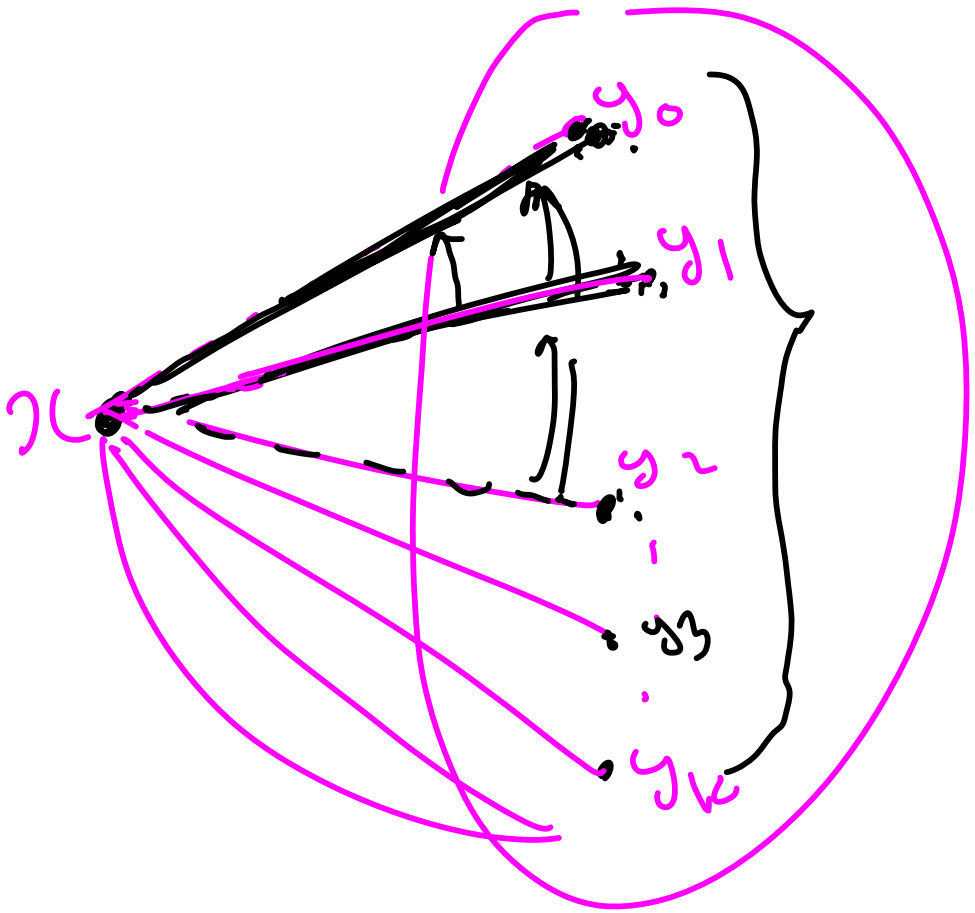


G

$G - e$

at most $\Delta + 1$ colors


C_0:
G_0
y_0
y_3
y_1
y_4
x
y_2



$C_0 \longrightarrow G_0$

$C_1 \longrightarrow G_1$

$C_2 \longrightarrow G_2$

$C_3 \longrightarrow G_3$

$\vdots$

$C_k \longrightarrow G_k$