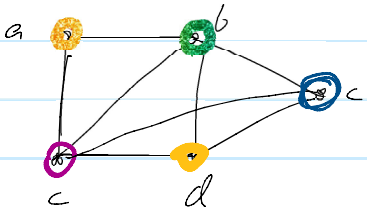
Graphs and Trees

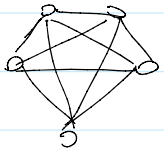
Monday, May 9, 2022 12:49 PM

Recall: Graphs and Trees

Ever. $G = (V, E)$ Coloring

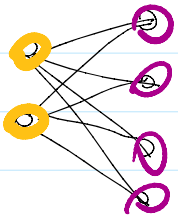


K_5



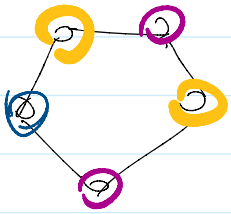
$\chi(K_n) = n$

$K_{2,4}$



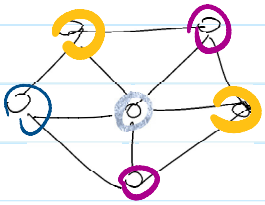
$\chi(K_{n,m}) = 2$

C_5



$$\chi(C_n) = \begin{cases} 3 & \text{if } n \text{ is odd} \\ 2 & \text{if } n \text{ is even} \end{cases}$$

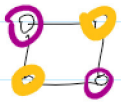
W_5

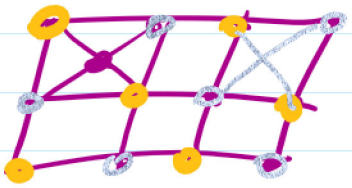


$$\chi(W_n) = \begin{cases} 3+1=4 & \text{odd} \\ 2+1=3 & \text{even} \end{cases}$$

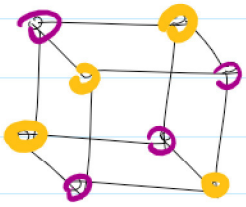
Q_2

Q_2



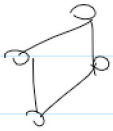


Q_3

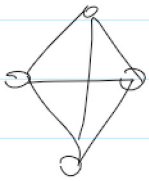


$\chi(Q_n) = 2$

Graph Isomorphism



$C_4 \cong Q_2$

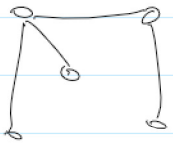


$K_4 \cong W_3 \not\cong C_4$

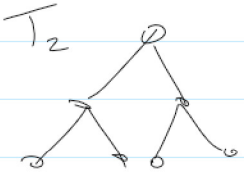
Tree → unrooted
→ rooted

Unrooted

T_1

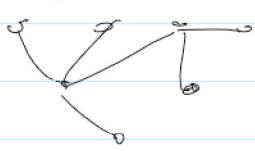


T_2



1, 1, 1, 1, 2, 3, 3

T_3



→ 1, 1, 1, 1, 1, 3, 4

$\Sigma \deg = 12$

$T \not\cong T_-$

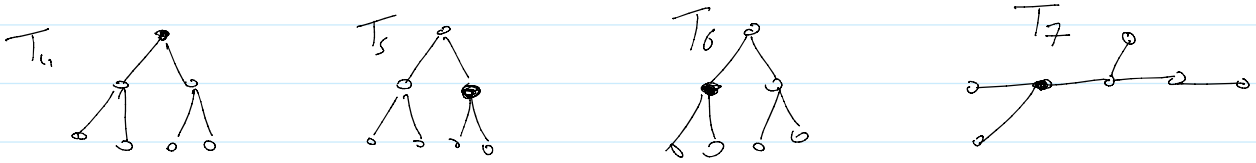
$T_2 \not\cong T_3$

$\sum deg = 12$

$\Rightarrow |E| = \frac{12}{2} = 6$

$\Rightarrow |V| = 6+1 = 7$

Rooted Trees



$T_5 \cong T_6$

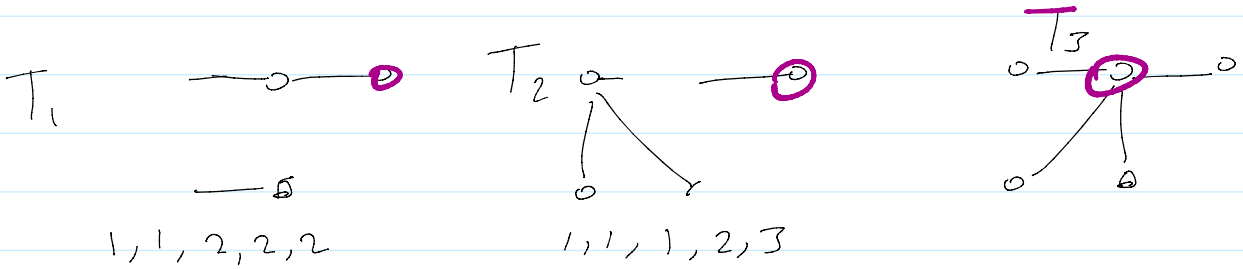
$T_7 \not\cong T_6$

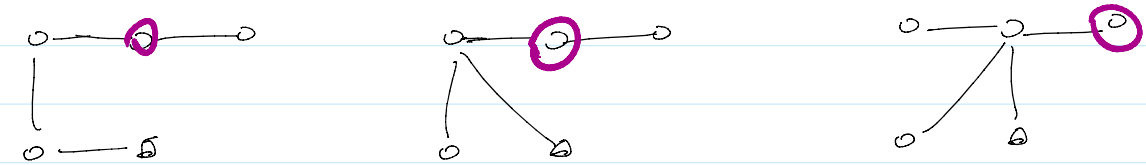
Exer

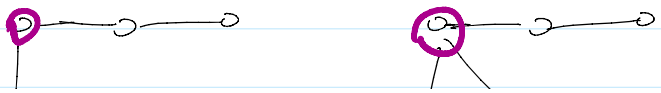
how many non isomorphic trees are there of size $|V|=5$ if

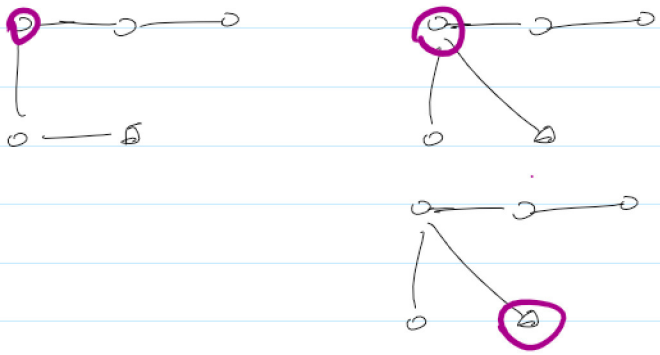
① the tree is rooted? 9 ?

② the tree is not rooted 3

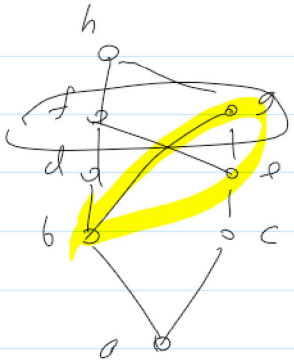








Quiz 4



max : h

greatest: h

least : a

UB {b, e, g}

g, h

LB : a

#2. Not lattice

for {f, g} has no GLB