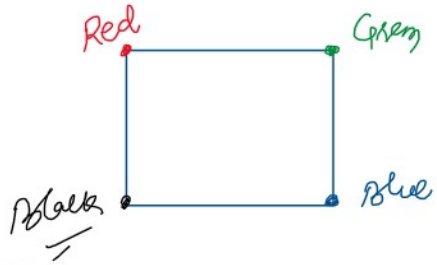
L29 13 April 2022

13 April 2022 10:05

Graph Coloring

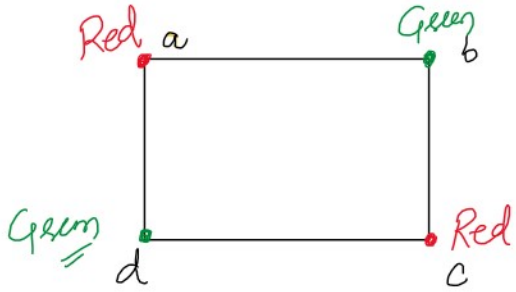
Coloring of a graph :- It is an assignment to color the vertices of the given graph in such a way no. two adjacent vertices are of the same color.



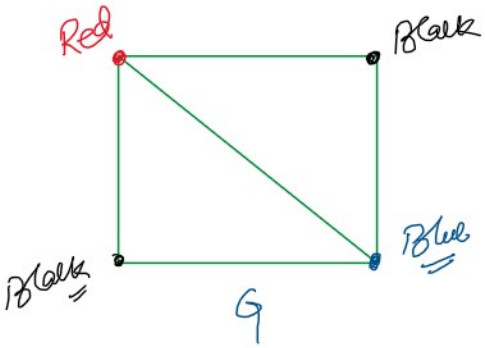
Chromatic no. of the graph :-

It is the minimum no. of colors required to color the graph in such a way that no two adjacent vertices are of the same color.

$\chi(G)$ (Chi)



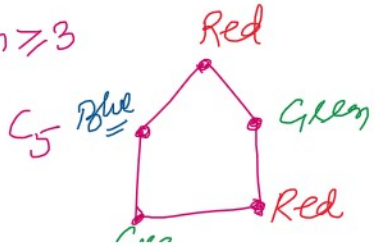
$\chi(G) = 2$

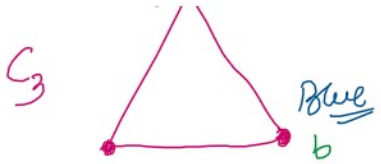


$\chi(G) = 3$

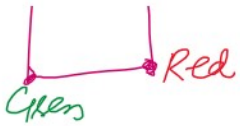
What is the chromatic no. of C_n, $n \geq 3$

$\chi(C_3) = 3$

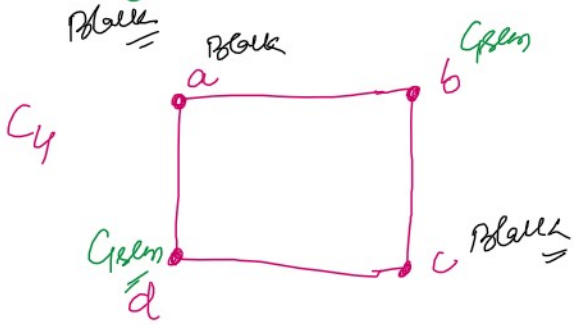




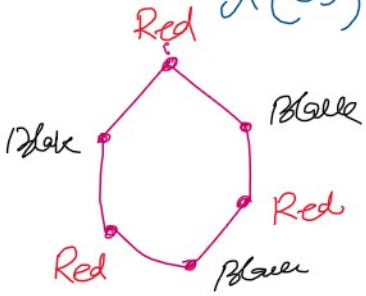
$\chi(C_3) = 3$



$\chi(C_5) = 3$



$\chi(C_4) = 2$



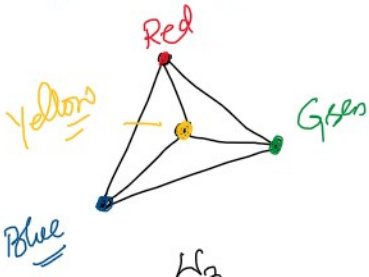
$\chi(C_6) = 2$

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

\# What is the chromatic no. of an empty graph with n vertices

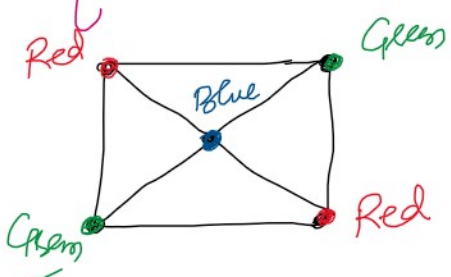
(a) n (b) 1 (c) 2 (d) $n-1$ (e) None of these

\# What is the chromatic no. of W_n, $n \geq 3$



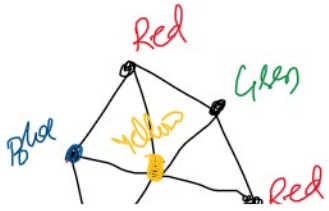
$\chi(W_3) = 4$

W_3

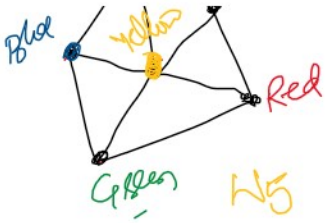


W_4

$\chi(W_4) = 3$



$\chi(W_5) = 4$



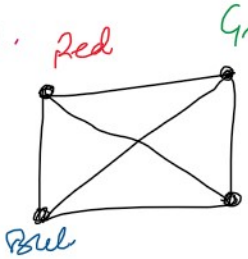
W_5

$\chi(W_5) = 4$

$$\chi(W_n) = \begin{cases} 3 & \text{if } n \text{ is even} \\ 4 & \text{if } n \text{ is odd} \end{cases}$$

The chromatic no. of K_n is

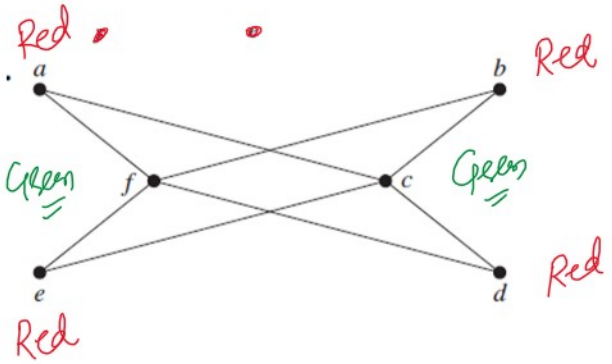
(a) 1 (b) 2 (c) n (d) None of these.

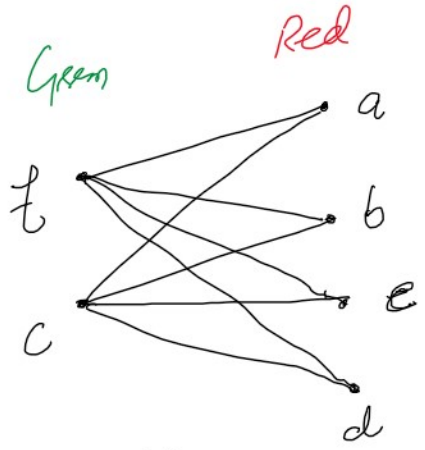


$\chi(K_4) = 4$

The chromatic no. of bipartite graph

$= 2$





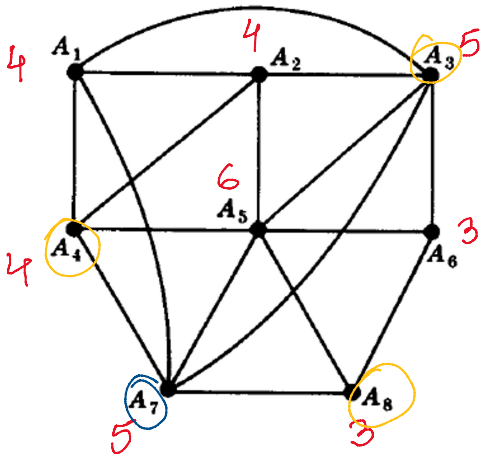
$K_{2,4}$

For what value of n, C_n is bipartite?

$n \geq 3$

n = even no. $\quad n \geq 3$

Welch Powell



6	5	5	4	4	4	3	3
A_5	A_7	A_3	A_1	A_2	A_4	A_8	A_6
Red	Blue	Yellow	Red	Blue	Yellow	Yellow	Blue

$\chi(G) = 3$