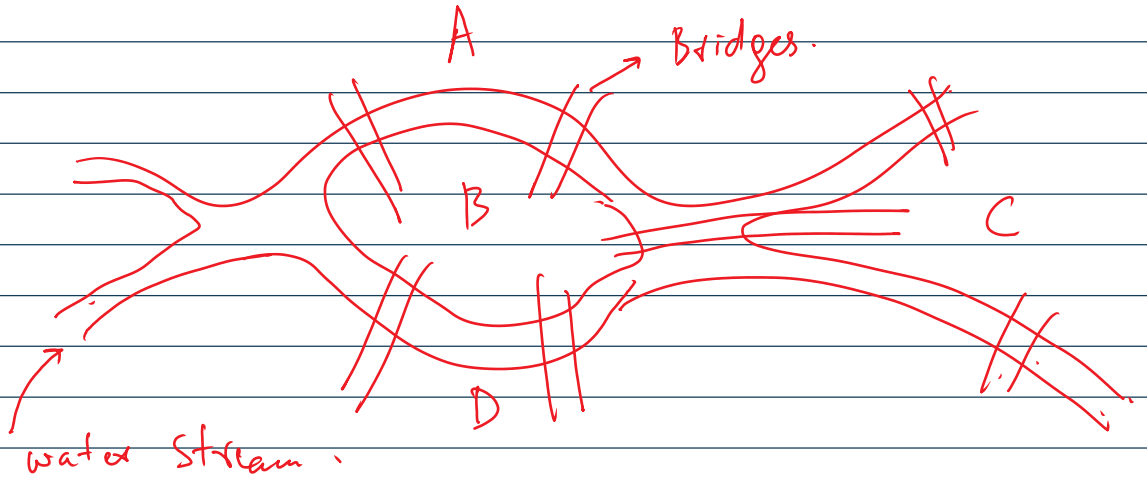
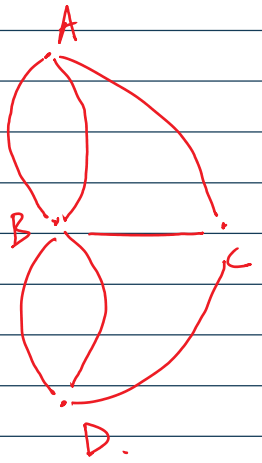
lecture 22:

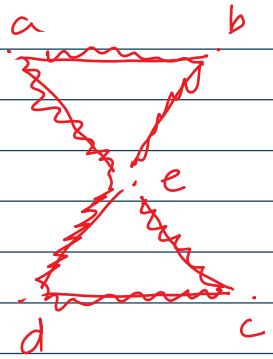
Euler Path / Euler Circuit.





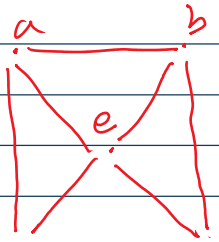
Ex 2

Path.



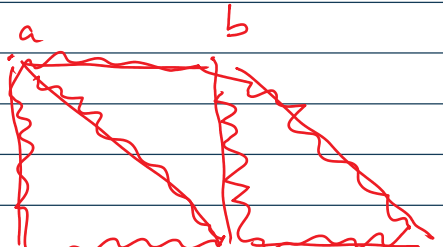
EC ✓

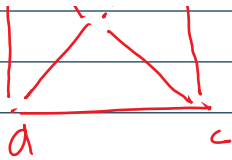
EP ✓.

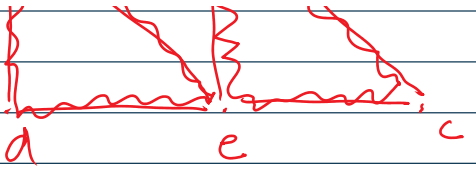


EC X

EP X.



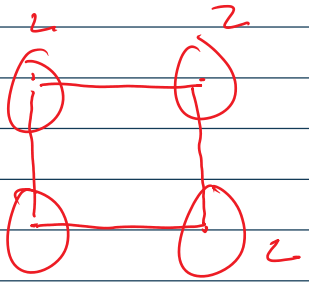


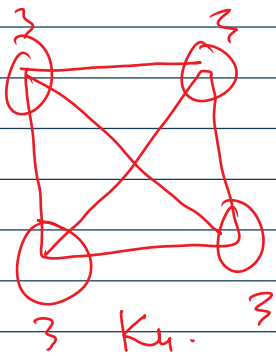


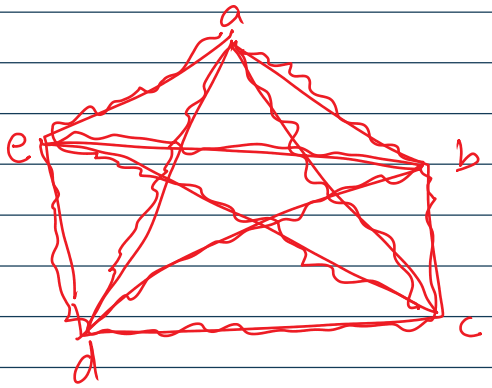
$\not\exists$ C ✗

$\not\exists$ P ✓

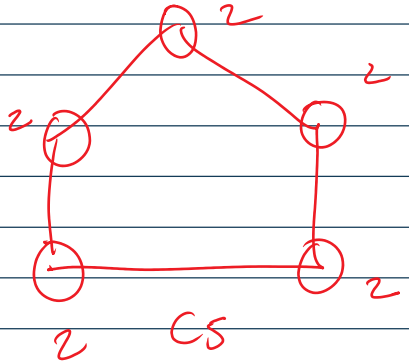
Theorem 1: A Connected graph with atleast 2 Vertices has Euler Circuit iff Each of it Vertices has even degree.

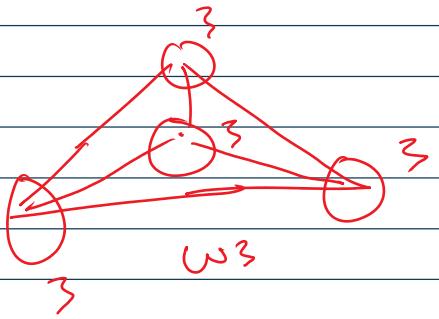


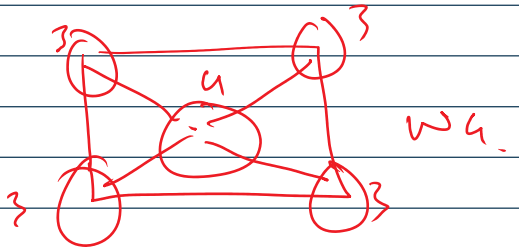




$K_5, K_7, K_9 \dots$

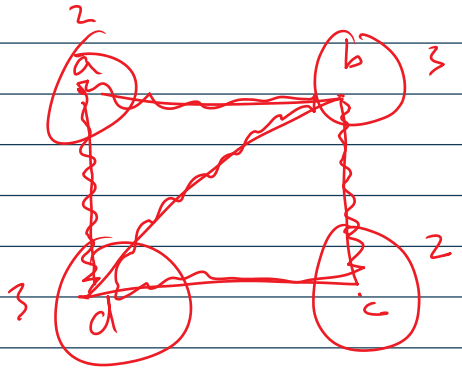




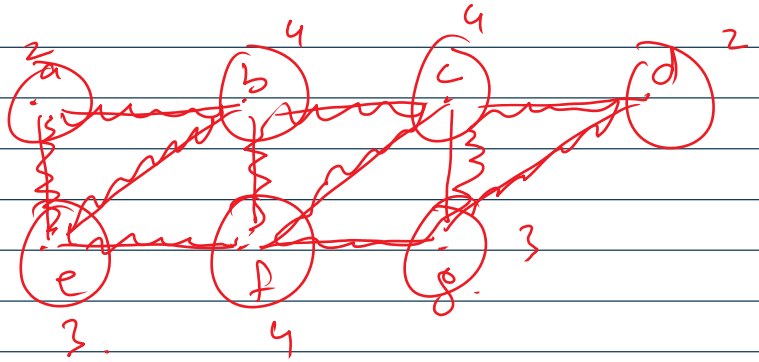


P 575 Theorem: A Connected graph has a Euler path but not a Euler Circuit iff it has exactly 2 Vertices of odd degree.

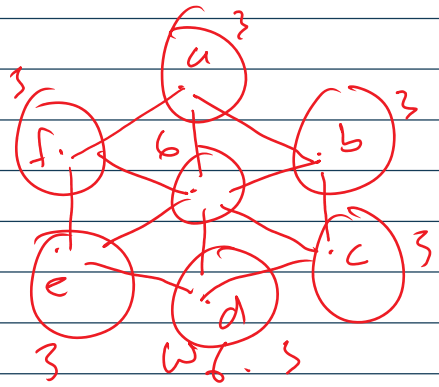
Ex 4
P575



EP ✓
EC X.



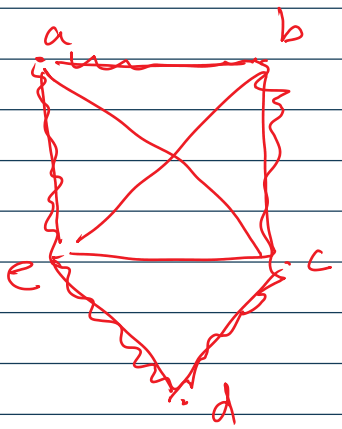
EP ✓
EC X.



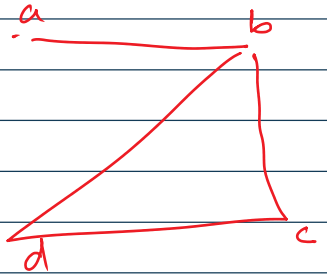
EP X
EC X.

Hamilton Path / Hamilton Circuit.

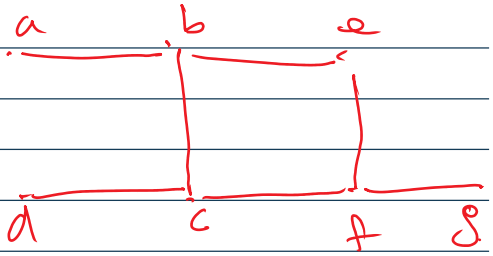
Ex 5
577.



HC ✓
HP ✓.

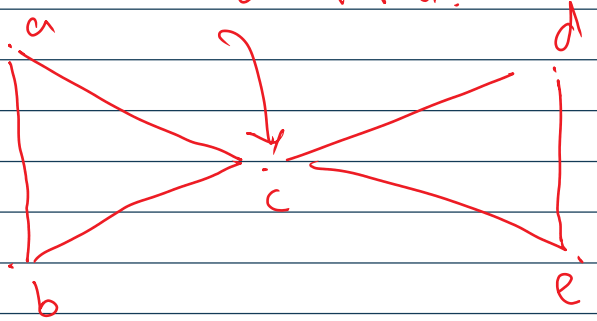


HC ✗
HP ✓.



HP ✗
HC ✗.

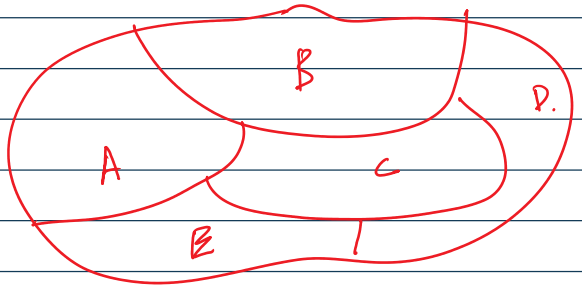
Cut Vertex.



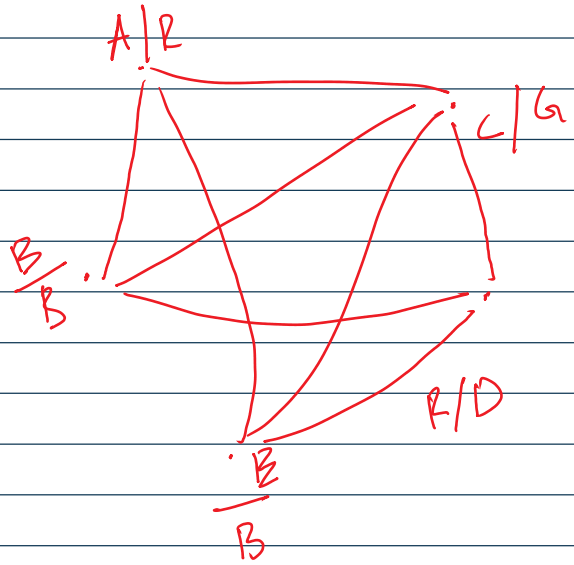
HC ✗
HP ✓.

Ex 581-583
(1 - 4w).

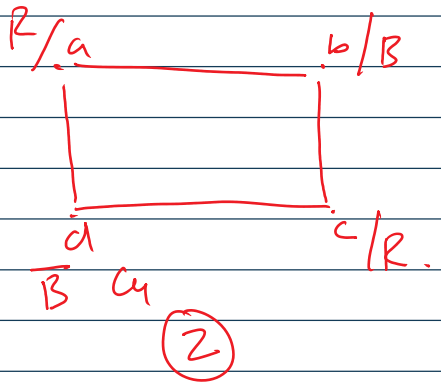
Graph Colouring :-



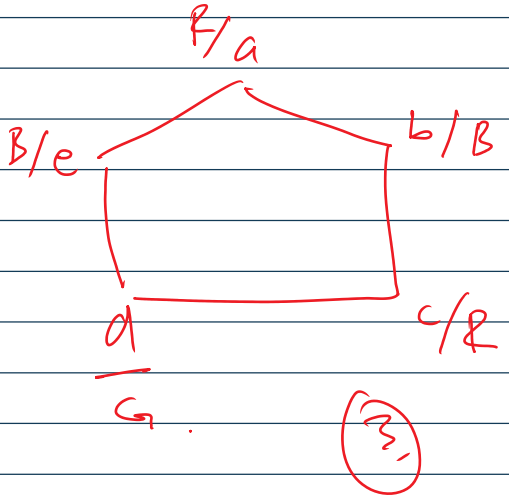
{R, B, G}.



Chromatic Number = 3

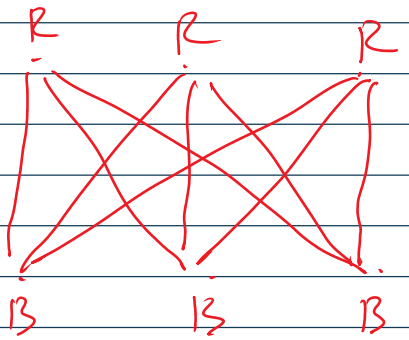


(2)

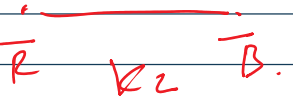


(3)

$K_{3,3}$

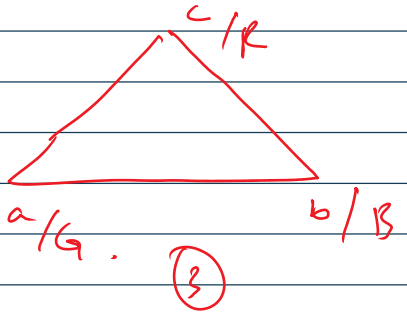


(2)

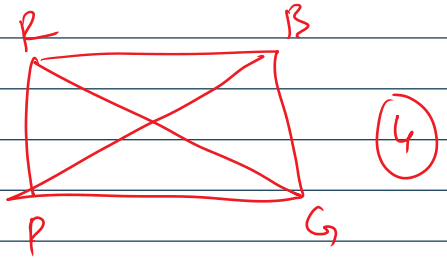


K_2

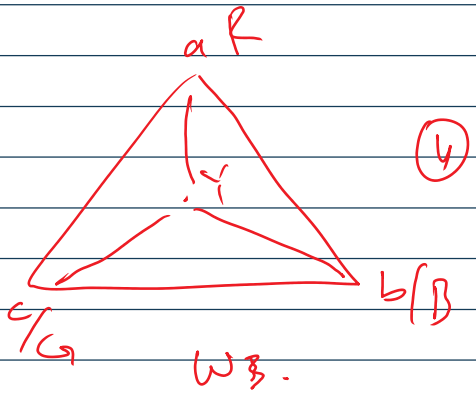
(2)



(3)

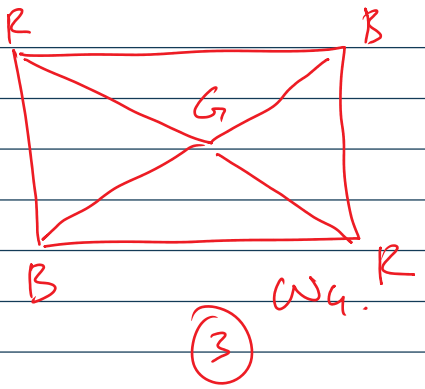


4



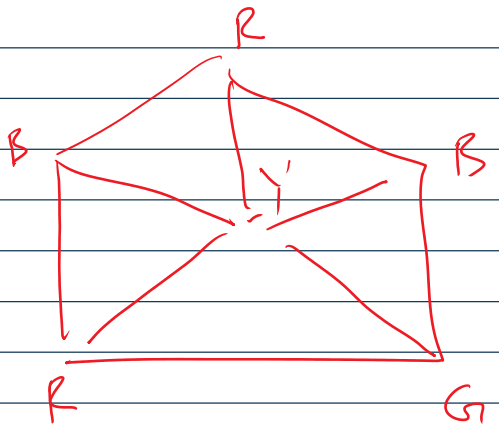
4

W8.



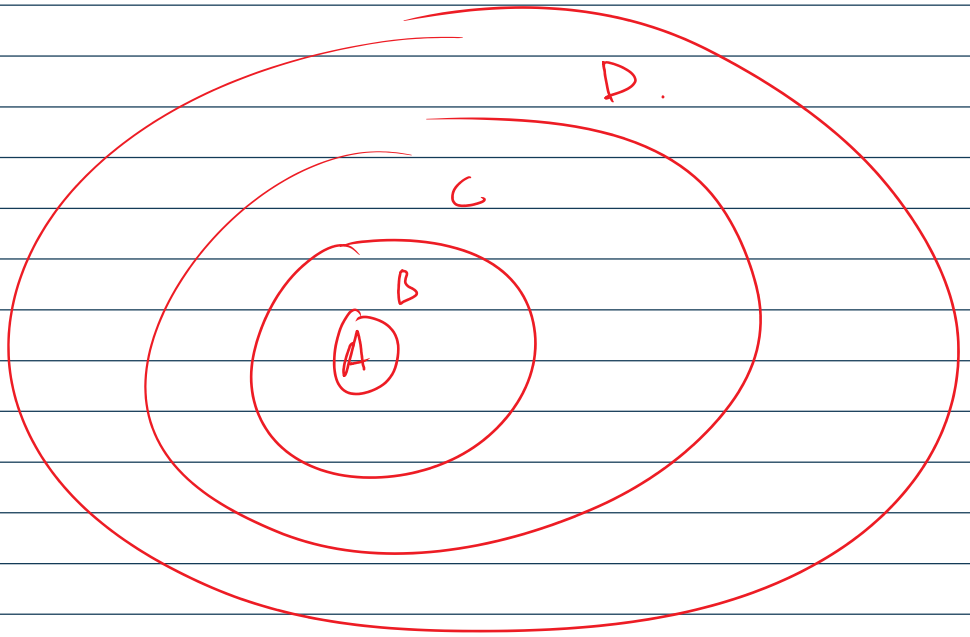
W4.

3



4

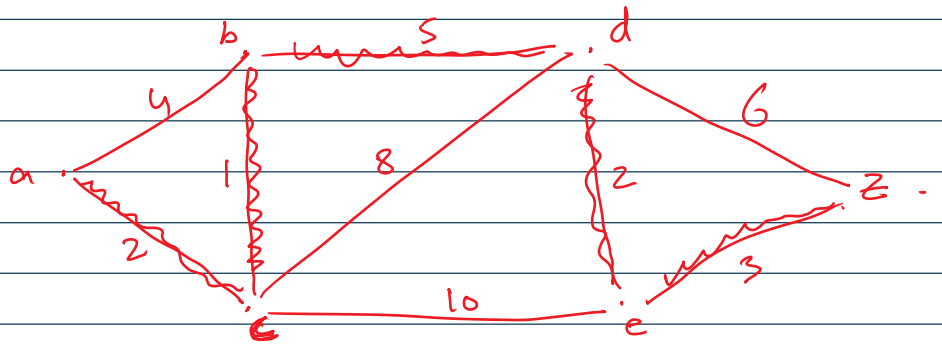
W5.



Ex 612 – 614
1 – 30.

Shortest Path Problem.

Dijkstra Algorithm.



c to z.

a to z.

	a	b	c	d	e	z	a c b d e z
	∞	∞	∞	∞	∞	∞	
a	$\boxed{0_a}$	4_a	2_a	∞	∞	∞	13.
c	$\boxed{0_a}$	3_c	$\boxed{2_a}$	10_c	12_c	∞	
b	$\boxed{0_a}$	$\boxed{3_c}$	$\boxed{2_a}$	8_b	12_c	∞	
d	$\boxed{0_a}$	$\boxed{3_c}$	$\boxed{2_a}$	$\boxed{8_b}$	10_d	14_d	
e	$\boxed{0_a}$	$\boxed{3_c}$	$\boxed{2_a}$	$\boxed{8_b}$	$\boxed{10_d}$	$\boxed{13_e}$	

593. Ex. (1–20).