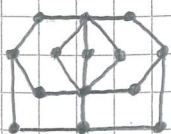


(F12)

- Bipartite graph (Note! K_1 is bip. ; both ABT and Rosen wrong.)
- $K_{m,n}$

Thm. Alg. to determine whether G is bipartite (distances).

Ex. Is  bipartite?

Cor. G bip. $\Leftrightarrow G$ contains no odd cycle.

Ex. How many subgraphs isom. to  does $K_{m,n}$ have?

- Forest, tree, leaf (deg. 0 or 1)

Obs. • Every tree has a leaf (≥ 2 if $|V| \geq 2$).

• $|V| = |E| + 1$ if $G = (V, E)$ is a tree.

• If $|V| = |E| + 1$ and $G = (V, E)$ connected, G is a tree.

Ex. A tree has 7 leaves, one vertex of degree 4, and all other vertices have degree 3. How many vertices?

- Spanning tree.

Cor. (of Obs) S.T. $\exists$ if (f) G is connected.

if time [Ex. How many bip. graphs have  as S.T. ?]

- Planar graph, plane (planar) embedding

III. K_4 ; $K_{2,m}$ planar. K_5 ? $K_{3,3}$?

- Regions (faces)

Thm. (Euler) $v - e + f = 1 + c$

if time, or next lec [P.F.]

Ex. How many regions can a planar embedding of a 4-regular graph on 16 edges have? ($\exists$?)

(Does exist. Example: .)