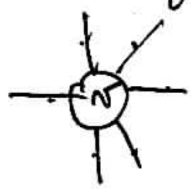
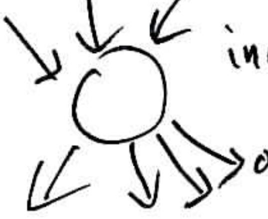
1

5/3 (Mon) Graph.

9.2 Terminologies & Special graphs.



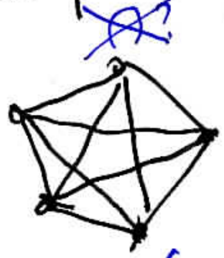
degree of v is 5.



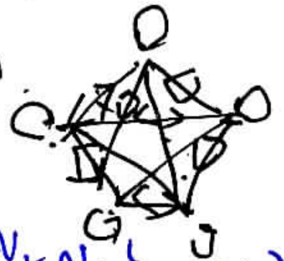
incoming degree 3

outgoing " 4

K_n : Complete graph. $\frac{n(n-1)}{2}$ edges



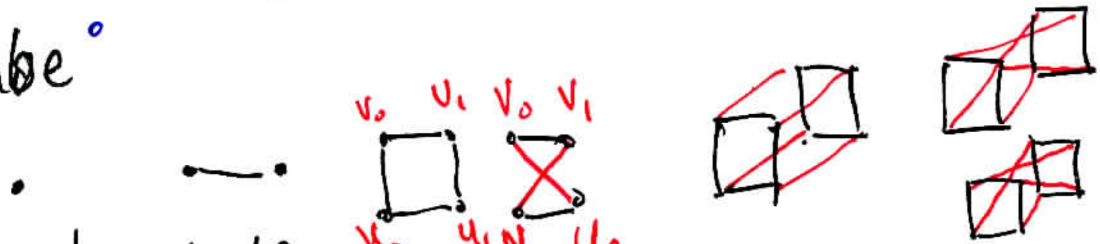
↳ in digraph



Cycle, Wheel $n \geq 3$

$(\{\}, \{\})$, $(\{v_1, v_2, \ldots v_n\}, \{\})$

n-cube

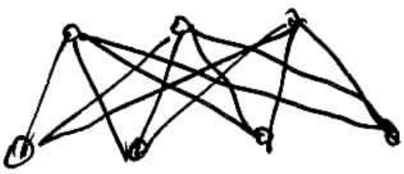


0-cube. 1-cube 2-cube 3-cube

n-cube is not a bipartite graph

But new edge are bipartite.

K_{3+4}



K_7 $(K_{3+4} \subseteq K_7)$

$=(V_1, E_1)$?

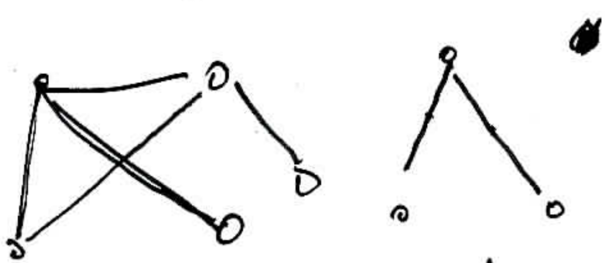
$G_1 \subseteq G_2 = (V_2, E_2)$

if $V_1 \subseteq V_2$

and $E_1 \subseteq E_2$

G is a subgraph of G_2

proper



G G' $G'' = G_1$

$G \supsetneq G' \cup G''$

$f: V \to V'$

$f = f': V \times V \to V' \times V'$

$(E \to E')$

We may write f instead of f'.

$\cancel{f'(\{u, v\}) = f(u)}$

$f'(u,v) = \{f(u), f(v)\}$

$f(u,v) = (f(u), f(v))$

Graph: connection between vertices.

Tree: Cycle-free (acyclic) & connected

Is it a tree, if a graph is acyclic
No! (disconnected)

→ A tree (is) acyclic → properties of tree.
" (is) connected →

Tree is acyclic connected graph. — def. of tree

the simplest connection of tree ; " characteristic

⇔ Acyclic connected graph is a tree.

properties ⊃ characteristic ⇕ definition

n vertices – at least (n−1) edges. ∧ connected ⟺ unique path —