Introduction to Graphs

Ian Ludden

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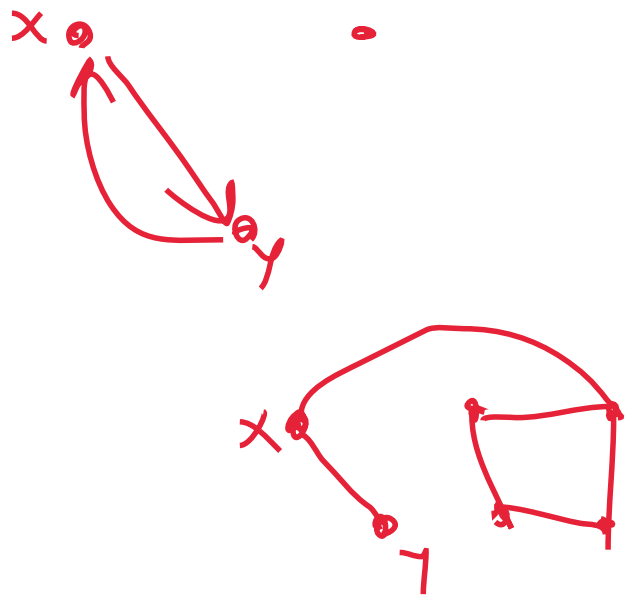

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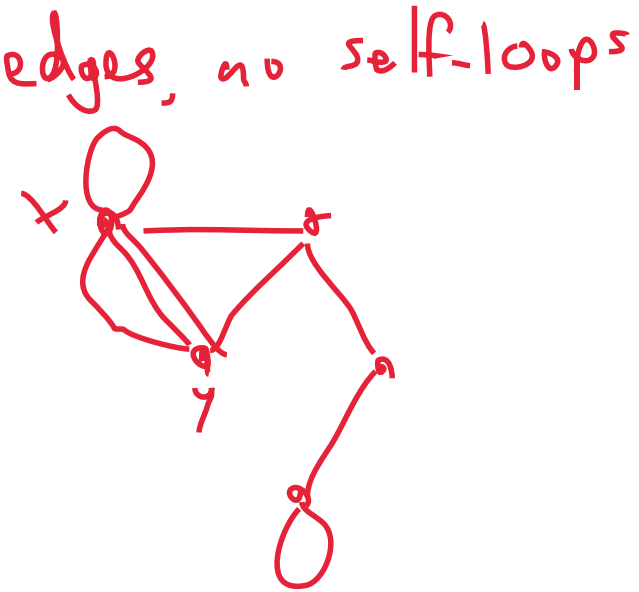

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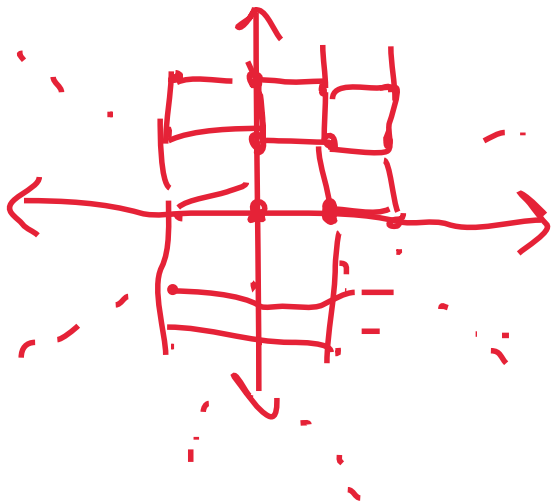

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Warning

Default assumptions: simple, undirected, at least one vertex, finite

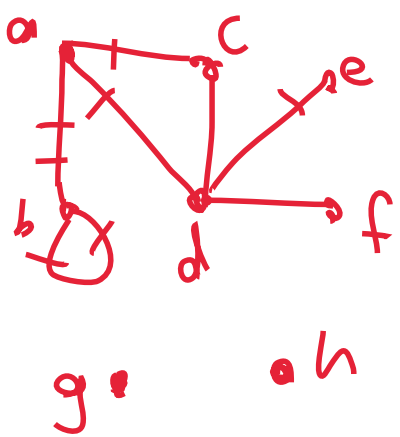
"graph"

$1 \leq |V| < \infty$

The sum of vertex degrees counts every edge twice.

Definition

The ***degree*** of a vertex in an undirected graph is the number of edges incident to it.



$\deg(a) = 3$

$\deg(b) = 3$

$\deg(e) = 1$

$\deg(h) = 0$

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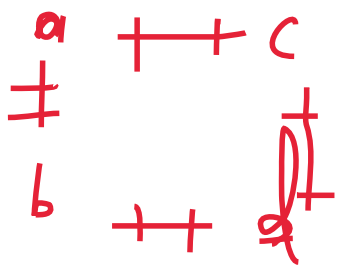
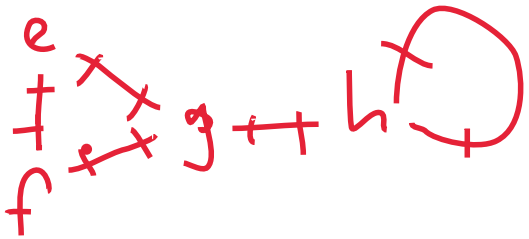
Theorem (Handshaking Theorem)

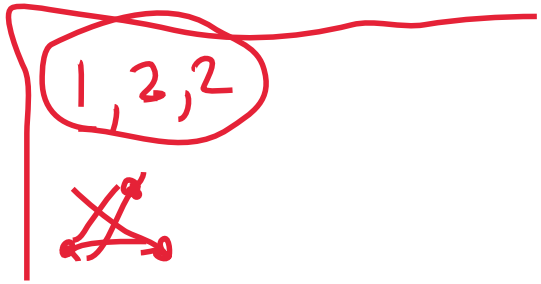
Let $G = (V, E)$ be an undirected graph. Then

$$\sum_{v \in V} deg(v) = 2|E|.$$

$|E| = \frac{\sum_{v \in V} deg(v)}{2}$







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