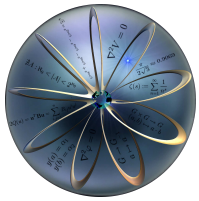

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incidence matrix with respect to an orientation

Canonical name	IncidenceMatrixWithRespectToAnOrientation
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Defines	orientation

Let G be a finite graph with n vertices, $\{v_1, \ldots, v_n\}$ and m edges, $\{e_1, \ldots, e_m\}$. For each edge $e = (v_i, v_j)$ of G choose one vertex to be the positive end and the other to be the negative end. In this way, we assign an *orientation* to G. The of G with respect an orientation is an $n \times m$ matrix $D = (d_{ij})$ where

$$d_{ij} = \begin{cases} +1 & \text{if } v_i \text{ is the positive end of } e_j \\ -1 & \text{if } v_i \text{ is the negative end of } e_j \\ 0 & \text{otherwise.} \end{cases}$$