

Dichordality and Ditriangulation

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1 Preliminaries

Definition 1.1. We call a directed edge, e_{xy} , a **dicord** if there exists some directed cycle, $C = (v_1, v_2, \dots, v_k, v_1)$, of length $k > 3$ such that $1 \leq x < y \leq k$ and v_x and v_y are non-adjacent in the cycle. We say a directed graph is **dichordal** if for each directed cycle of length 4 or greater has a dicord.

To meaningfully create a directed counterpart to triangulation algorithms, we need an analogue to the simplicial vertices in undirected graphs. Unfortunately, the obvious analogue, that a vertex induces a clique, is denied. We thus pause on this point for a moment.

Definition 1.2. Let $G = (V, E)$ be a dichordal graph. Then, we call the graph $H = (T, F)$ a **triangular representation** of G if it satisfies the following:

- 1.