# On a base exchange game on graphs

Abstract: We consider the following maker-breaker game on a graph G that has a partition of the edge set E into two spanning trees E_1 and E_2. Initially the edges of E_1 are red and the edges of E_2 blue. Maker and breaker move alternately. In a move of the maker a blue edge is coloured red. The breaker then has to recolour a different edge blue in such a way that the red and the blue edges are spanning trees again. The goal of the maker is to exchange all colours, i.e. to make E_1 blue and E_2 red.

We study this game on the K_4, where the breaker wins, and on larger wheels, where the maker has a winning strategy. Furthermore, we provide an example of a graph where, for some partitions, the maker wins, for some others, the breaker wins.

Maker Wins   Breaker Wins   Maker Wins
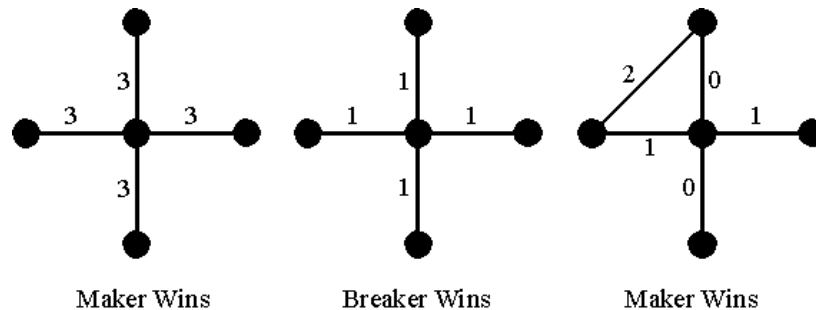
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RECEPTION AT 3:15 IN MATHEMATICS LAB