Problem of the Week
Problem D
The Carousel Game

Adults play a game that begins with one child on each of the six seats of a carousel. The seats are arranged on the vertices of a hexagon. (A top view of the carousel is shown above. The blue circles are spaces where the children sit on the ride and the red circle indicates the centre about which the ride rotates.)

On a turn, an adult player can help one child off the carousel or help two children sitting beside each other off the carousel. (If two children are sitting beside each other with no empty seats between them, we say they are adjacent.)

Adults Xena and Oliver alternate turns helping children off the carousel with Xena going first. Whoever helps the last child off the carousel wins the game.

What should Oliver do after Xena’s first move, in order to always be able to win the game? If this is possible, it is referred to as a winning strategy.

Remember, on her turn, Xena can help any child off the carousel or any two adjacent children off the carousel. For example, if we are looking down at the carousel from above, Xena could help the child on the left off the carousel, or she could help the two bottom children off the carousel.

You will probably better understand this game by playing it with a partner but you do not need a carousel – you can just draw pictures.