"Tournament" Tree Order Worksheet

Tournament. In this problem you will work with a single elimination bracket tournament of N competitors. However, each round only consists of one game. The single game per round format allows the entire audience to focus their attention on the match. There will always be N - 1 games because one player will be eliminated in each game. At the beginning of the tournament there will be N - 1 game areas lined up in a row. There is exactly 1 player spot between each adjacent pair of game areas. There are two additional player spots before the first game area and after the second game area. Each player will take one of these spots; no spot will be occupied by two players.

Below is a visual representation of the play area with 5 players.

Player 1	Area 1	Player 2	Area 2	Player 3	Area 3	Player 4	Area 4	Player 5

In each round a single game area will be used for a game and the player closest on the left will play against the player closest on the right to determine a victor (there are never draws). After which the losing player will leave the victor will remain for any remaining games. Given any execution and win/lose order there will always be exactly two players that can play each game.

1. Draw a visual bracket of the games that would be played given the following Area activation order.
   Order: 1, 4, 2, 3

2. Given any Area activation order what would be the most number of games any player could play?

3. Given any Area activation order what would be the least number of games we could **guarantee** a player would play (given any possible win order)?

4. What tree traversal order does the activation order most closely resemble?