Individual Final Round

I2MC 2025

1. Determine the greatest possible volume of a tetrahedron $ABCD$ satisfying
$$AB + BC + CD = 10.$$
2. A chess king is hunting on an infinite chessboard. Their target is two squares east and two squares north of them. Each minute, the king can move to any of the eight adjacent squares, or lie patiently in wait and stay still. How many ways can 4 minutes play out if the king is at their target by the end?
3. Compute
$$\sqrt{1-\sqrt{1^2-1}}+\sqrt{2-\sqrt{2^2-1}}+\cdots+\sqrt{2025-\sqrt{2025^2-1}}.$$