

1077-G1-2571 **Reza D Noubary*** (rnoubary@bloomu.edu), Dept. of Mathematics, Bloomsburg University,
Bloomsburg, PA 17815. *Rule of Tangent for Win-By-Two Games.*

We introduce a trigonometric interpretation of the odds of winning points and games in tennis when serving from deuce. We place this result in the more general setting of a gambler's ruin problem and also propose a performance measure to quantify the serving and receiving skill of one player relative to another. Then we extend the analysis to table tennis and volleyball. These latter games are similar to tennis in that the winner must obtain a certain minimum score while leading by two points, but they differ in their determination of which player serves a given rally and in whether a point is awarded to the receiver for winning a rally. We quantify the impact of these differences on the outcomes of games, assuming that the probability for a player to win a single point does not change during a game (Received September 22, 2011)