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MATHEMATICAL MODELS IN TENNIS

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Tennis is a technically and psychologically challenging sport. The student is required not only to have physical abilities, reaction speed, but also the ability to concentrate for a long time, as well as maintain an acceptable level of mental stability throughout the game, which can last more than 2 hours. To achieve high results, a trainer can develop a method of targeted training, which makes it possible to acquire the necessary theoretical, technical, tactical, physical and mental conditions. The pedagogical techniques implemented by the coach will be effective for athletes to varying degrees, depending on their level of athletic qualifications, competitive experience, gender, individual characteristics, etc.

Mathematical models use the strict language of mathematics and computer experiment to describe physiological phenomena, which makes it possible to quantify various phenomena arising from model representations.

Modeling is an effective tool for identifying non-obvious consequences. The ability to manipulate model parameters in wide ranges makes it possible to find different modes of system functioning, which, due to the complexity and high degree of nonlinearity of biological systems, are often impossible to predict using verbal schemes. In this sense, a model, if it is complex enough to be realistic, can be a source of new knowledge, sometimes even counterintuitive.

Launch angle is measured against a horizontal line to the court. It is positive if the angle is above the line and negative if below. All other shot parameters remaining equal, the racquet with the higher power potential will hit the ball faster and at a lower launch angle. Less powerful racquets will launch at a higher angle. It is possible the two effects will cancel and the ball would land in the same spot. It is also possible that one effect will be greater than the other — for example the less powerful racquet (lower launch speed) launching at a higher angle and actually hitting farther. That's why it is sometimes confusing when talking about power. But power refers to speed not distance. Fortunately, most of the time, the more powerful racquet will hit both faster and farther, though not necessarily farther.

Balls bouncing off the court will always have topspin. That is true whether the ball landed on the court with backspin or topspin. If it landed with backspin, it will have less topspin after the bounce than if it landed with topspin.

If we volley a ball, it may have an incoming spin of either backspin or topspin.

For examle, we can change the spin of an incoming ball a lot and still not have much to show for it. On the other hand, we can change it just a little, and get a whole lot.

An important feature of tennis is the indirect execution of a striking action. The player performs the striking action not directly with his hand or foot, as in volleyball or football, but with the help of a racket. When choosing a racket, it is necessary to take into account the athlete's playing style, which are directly related to the anthropometric characteristics of his body and the level of physical development and fitness. A lot depends on the weight, balance, size of the racket head, tension of the strings and what they are made of. A well-chosen racket should help the player hide his weaknesses and strengthen his strengths. It is no coincidence that they say that a tennis player should have the arm of a boxer, the legs of a runner, the strength of a weightlifter, the intelligence of a chess player, the courage of a mountaineer, and the nervous system of an astronaut.

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ANALYSIS OF THE POSSIBILITY OF PLAYING TABLE TENNIS FOR THE ELDERLY

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The development of physical education methods for the elderly is relevant due to the increase in life expectancy worldwide. Exercising motor skills can help maintain mobility, reduce the risk of falls, and