$\mathcal{M}\mathcal{M}\textbf{G}$ *Mathematical Modelling and Geometry*

Expressions of players' guaranteed payoffs in a noncooperative game modelling commodity purchase and realization process

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Abstract. A noncooperative game that models a process of purchase and realization of a certain commodity is considered. The participants of the modelled process are two shops competing with each other. The players in the considered game correspond to these shops. Expressions of players' guaranteed payoffs and also of upper evaluations of the guaranteed payoffs are determined. The determination of these expressions is actually reduced to the investigation of properties of some surfaces.

Keywords: game, noncooperative game, player, strategy, situation, payoff, payoff function, guaranteed payoff, shop, commodity, purchase, sale, price, buyer, profit

MSC numbers: 91A10

References

[1] Vorobiov N.N. *Fundamentals of games theory. Noncooperative games.* – Moscow: Science, 1984. – 496 p. (in Russian)

[2] Fudenberg D. and Tirole J. *Game theory.* – Cambridge: MIT Press, 1991.

[3] Gibbons R. *Game theory for applied economists.* – Princeton: Princeton University Press, 1992.

[4] Osborne M. and Rubenstein A. *A course on game theory.* – Cambridge: MIT Press, 1994.

[5] Osborne M. *An introduction to game theory.* – New York: Oxford University Press, 2003.

[6] Myerson R. *Game theory: analysis of conflict.* – Cambridge: Harvard University Press, 1997.

[7] Dixit A. and Nalebuff B. *Game theory.* – Indianapolis: Library of Economics and Liberty, 2008.

[8] Julmi C. *Introduction to game theory.* – Copenhagen: BookBooN, 2012.

[9] Sushkin V.V., Guttina A.M. *A mathematical model of commodity purchase and realization process (model building stage).* // Mathematical methods of control: Collection of scientific works. – Tver: Tver state university, 2011. – Pp. 65 – 69. (in Russian)