$$X_i = \alpha_i + \beta_i \quad (i = 1, \ldots, 9).$$

Conclusion. In the course of the work it is shown that all solutions of an random matrix equation with commutative coefficients of size $[2 \times 2]$ can be analytically obtained. Also, the algorithm for finding these solutions is presented.

Reference list:

1. Higham, N.J. Solving a Quadratic Matrix Equations by Newton's Method with Exact Line Searches / N.J. Higham, H.-M. Kim // SIAM J. Matrix Anal. Appl. – 2001. – Vol. 23, № 2. – P. 303–316.
2. Bai, Z.-Z. Modified Bernoulli iteration method for quadratic matrix equation / Z.-Z. Bai, Y.-H. Gao // Journal of Computational Mathematics. – 2007. – Vol. 25, № 5. – P. 498–511.
3. Kurosh, A. Kurs of the higher algebra / A. Kurosh. – 17nd ed. – St. Petersburg: Lan, 2008. – 432 p.
4. Horn, R. Matrix analysis / R. Horn, C. Johnson. – Moscow: Mir, 1988. – 655 p.

FITTING PERMUTATION CLASSES OF π- SOLUBLE GROUPS

N. Doroshinsky
VSU named after P.M. Masherov, Vitebsk, Belarus

The main goal of the paper is a description of Fitting permutation classes. All considered groups are finite. In the definitions and notation, we follow [1].

DEFINITION 1[1]. A class $\mathfrak{F}$ is a *Fitting class* if and only if the following two conditions are satisfied:

1) if $G \in \mathfrak{F}$ and $N \trianglelefteq G$, then $N \in \mathfrak{F}$;
2) if $M, N \trianglelefteq G = MN$ with M and N in $\mathfrak{F}$, then $G \in \mathfrak{F}$.

Let $\mathbb{P}$ be a set of all primes and $\pi \subseteq \mathbb{P}$. An π-number is an integer whose prime divisors all belong to π. A subgroup H of a group G is called a *Hall π-subgroup* if $|H|$ is a π-number and $|G{:}H|$ is a π'-number, where $\pi' = \mathbb{P} \setminus \pi$.

A subgroup H of G is called a *Hall subgroup* if it is a Hall π-subgroup for some

$\pi \subseteq \mathbb{P}$. Evidently H is a Hall subgroup of G if and only if $(|G{:}H|, |H|) = 1$.

Let $\mathfrak{F}$ be a Fitting class of a group G. A subgroup V of G is called $\mathfrak{F}$ -*maximal* if the following conditions are satisfied:

1) $V \in \mathfrak{F}$;
2) if $V \le U \le G$ and $U \in \mathfrak{F}$, then $U = V$.

The subgroup V of G is called $\mathfrak{F}$ –*injector* if $V \cap K$ is $\mathfrak{F}$ -maximal subgroup of K for every normal subgroup K of G.

DEFENITON 2 [1]. *The operator* $L_\pi(\ )$. Let π be a set of primes, and let $\mathfrak{F}$ be a Fitting class of finite soluble groups and $\mathfrak{S}$ is a class of all soluble groups. Then define

$L_\pi(\mathfrak{F}) = (G \in \mathfrak{S}$: the $\mathfrak{F}$-injectors of G have π'-index in $G)$.

Thus $L_\pi(\mathfrak{F})$ consists of all finite soluble groups whose $\mathfrak{F}$-injectors contain a Hall π-subgroup: in particular, we have $L_\varnothing(\mathfrak{F}) = \mathfrak{S}$ and $L_P(\mathfrak{F}) = \mathfrak{F}$.

Let $\mathfrak{F}$ and $\mathfrak{H}$ be a Fitting class. Then $\mathfrak{F}\mathfrak{H} = (G$: $G/G_{\mathfrak{F}} \in \mathfrak{H})$. Let $\mathfrak{E}_{\pi'}$ be a class of all π'-groups. In [2], the theorem is proved that if $\mathfrak{F}\mathfrak{E}_{\pi'} = \mathfrak{F}$, then in any π-soluble group there are $\mathfrak{F}$-injectors and any two of them are conjugate.

Doerk and Hawkes in the class of all finite soluble groups obtained a criterion for the permutability of Fitting classes. In connection with it the actual task of extending this result to the case of partially solvable groups. The solution to this question is the main goal of this paper.

Let $\mathfrak{S}^\pi$ be a class of all π-soluble groups.

THEOREM. Let $\mathfrak{F}$ be a Fitting class, let $\pi \subseteq P$, and let $G \in \mathfrak{S}^\pi$. Let V and $G_{\pi'}$ denote respectively an $\mathfrak{F}$ -injector and a Hall π'-subgroup of G, and put

$W = \langle V, G_{\pi'} \rangle$. Then W is an $L_\pi(\mathfrak{F})$ -injector of G if and only if $VG_{\pi'} = G_{\pi'}V$.

Reference list:

1. Doerk K. Finite soluble groups/ K. Doerk, T. Hawkes. – Berlin-N.Y.: Walter de Cruyter, 1992.
2. Vorob'ev N. T., Nanying Yang, W. Guo. On F- injectors of Fitting set of a finite groups// Com. in Algebra, 2018, Vol 46, №1. P. 217-229

THE INVARIANCE OF PROPERTY OF SEPARATION FROM ZERO CORNER MINORS IN THE SIMILARITY TRANSFORMATION USING THE LOWER TRIANGULAR MATRIX

K. Kalita
Polotsk State University, Novopolotsk, Belarus

Exploring characteristics of a numerical matrix in its various matrix transformations (e.g., in the similarity transformation, congruence, etc.) is one of the main problems in matrix theory.

The aim of this paper is to learn preservation of the principal leading corner minors' of a square n-dimensional matrix positivity and, moreover, of their separation from zero using the similarity transformation on the set of lower triangular matrices with positive diagonal elements.

Material and methods. We obtained the main results using the methods of linear algebra and matrix theory.

Findings and their discussion. Let R^n be a n-dimensional Euclidean vector space supplied with the norm $\|x\| = \sqrt{x^T x}$ (here the symbol T means the transpose of a matrix or a vector); $e_1, e_2, \ldots, e_n$ be vectors (columns) of the canonical orthonormal basis for the space R^n; M_{mn} be the space of real $m \times n$-dimensional matrices supplied with the spectral (operator) norm