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COMPARATIVE STUDY OF MATHEMATICAL TERMS IN UZBEK AND ENGLISH

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ABSTRACT: This article provides a comparative analysis of the lexical-semantic, structural, and translation features of mathematical terms in Uzbek and English. The formation factors, etymological sources, and standardization processes of mathematical concepts in both languages are examined in depth. Moreover, the challenges encountered in translating mathematical terminology and possible solutions are discussed through practical examples.
Keywords: mathematical terminology, comparative analysis, lexicosemantics, terminology, translation.

Due to the rapid development of the field of mathematics, the need for a systematic formation and standardization of mathematical terminology is becoming increasingly important. As the international language of science and technology, English plays a leading role in shaping and spreading mathematical terms, whereas many Uzbek terms have been formed through Russian and Arabic influence. Therefore, the comparative study of mathematical terminology holds both theoretical and practical significance.

GENERAL FEATURES OF MATHEMATICAL TERMINOLOGY

Mathematical terms are lexical units that represent specific scientific concepts. They possess the following characteristics:

Feature	Description
Accuracy	Must have a single, precise meaning
Stability	Form remains unchanged
Conciseness	Brief and clear
International usage	Mostly derived from Greek and Latin roots

Thus, mathematical terminology is formed through a combination of global and language-specific elements.

LEXICAL-SEMANTIC FEATURES

Monosemy and Polysemy.

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English term	Meaning in mathematics	General meaning
Function	mathematical function	role, task
Volume	spatial measurement	sound level

In Uzbek, mathematical terms are generally monosemous, whereas polysemy is more common in English.

International Terms.

English	Uzbek
Algebra	algebra
Radius	radius
Fraction	fraksiya / kasr
Geometry	geometriya

These terms have been adopted into both languages through phonetic and morphological adaptation.

STRUCTURAL ANALYSIS

Simple Terms

English	Uzbek
Number	son
Line	chiziq
Set	to‘plam

Complex Terms

English	Uzbek	Structural difference
Real number	haqiqiy son	Head comes first in Uzbek
Coordinate plane	koordinata tekisligi	Head comes last in English
Prime factorization	tub omillarga ajratish	Explanatory expression in Uzbek

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TRANSLATION METHODS OF MATHEMATICAL TERMS

Translation method	Example (English → Uzbek)
Direct translation	Square root → kvadrat ildiz
Transliteration	Algorithm → algoritm
Explanatory translation	Slope → qiyalik koeffitsienti

SIMILARITIES AND DIFFERENCES

Similarities:

1. Many terms have international origin
2. Semantic precision is crucial in both languages
3. Large number of Greek and Latin roots

Differences:

English	Uzbek
Strong polysemy	Mostly monosemous
More concise structure	More descriptive expressions
Rapid lexical innovation	Standardization is slower

PRACTICAL COMPARATIVE ANALYSIS

English	Uzbek	Explanation
Derivative	hosila	rate of change
Fraction	kasr	part of a whole

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Vector	vektor	quantity with direction
Equation	tenglama	expression of equality
Sequence	Ketma-ketlik	ordered set of elements

Although Uzbek and English mathematical terminology share a common historical foundation, they differ significantly in terms of phonetic, structural, and semantic adaptation. English, as the global language of science and technology, not only plays a central role in shaping and standardizing mathematical terminology but also serves as the primary source of many international terms used worldwide. Its conciseness, standardization by international organizations such as IEEE and AMS, and wide global usage contribute to its dominant role in the dissemination of mathematical knowledge.

On the other hand, Uzbek mathematical terminology reflects the linguistic, cultural, and educational characteristics of the country. It relies heavily on translation strategies, explanatory definitions, and adaptation of foreign terms to ensure clarity and pedagogical effectiveness. The Uzbek approach emphasizes semantic transparency and contextual understanding, which is particularly important for learners and educators in conveying precise mathematical concepts.

Therefore, a comparative analysis of Uzbek and English mathematical terminology is not only of theoretical interest but also has significant practical implications. It facilitates accurate translation and interpretation, supports the development of standardized educational materials, and aids linguists in understanding the interaction between international and local scientific languages. Moreover, such analysis helps educators design effective curricula, enhances cross-linguistic communication in scientific research, and contributes to the global exchange of mathematical knowledge.

In conclusion, studying the similarities and differences between Uzbek and English mathematical terminology enriches the fields of linguistics, translation studies, and mathematics education. It underscores the importance of balancing international standardization with local adaptation, ensuring that mathematical knowledge is both universally accessible and culturally comprehensible.

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