



# Russia, Chelyabinsk State University

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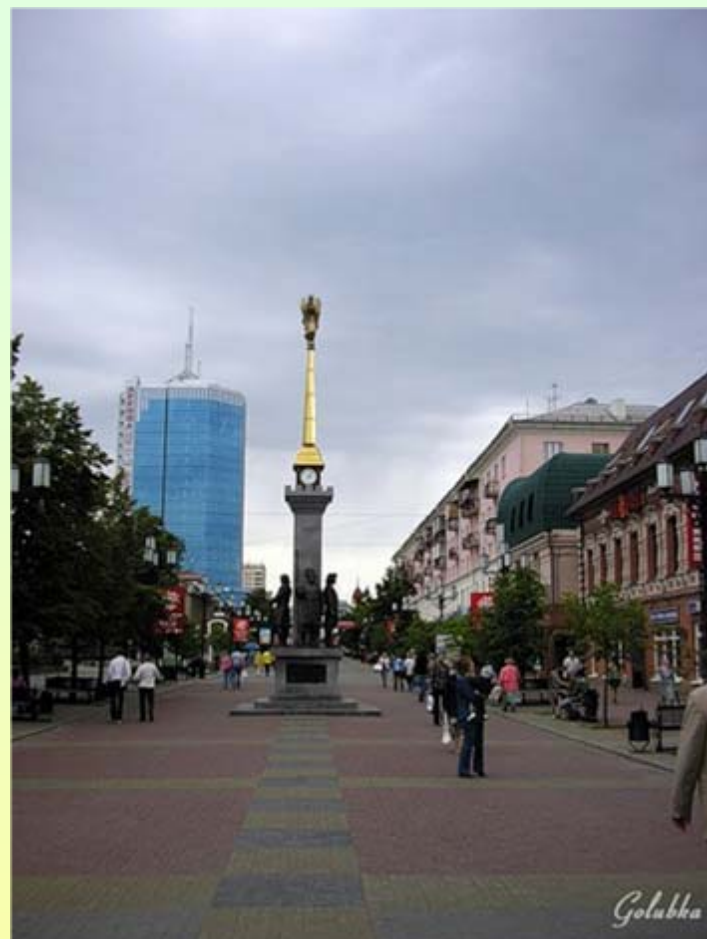
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# Chelyabinsk State University was founded in 1976

*In 2008, higher professional education programs are realized for:*

- 34 majors,
- 35 specialities for postgraduate studies,
- 22 programs of post-university education,
- 15 fields for Bachelors program,
- 7 fields for Masters teaching,
- 25 programs of post-secondary education.



# CSU today

- ✓ More than 22 thousand students.
- ✓ 15 faculties.
- ✓ 7 institutes.
- ✓ 3 branches.
- ✓ 14 representatives.
- ✓ 30 research schools
- ✓ More than 300 PhD, more than 80 Doctors of Sciences.
- ✓ 4 Dissertation Councils for the Doctors-to-be and 3 Councils for the PhDs.





# CSU faculties

- ❑ Faculty of Mathematics
- ❑ Faculty of Physics
- ❑ Faculty of Chemistry
- ❑ Faculty of Biology
- ❑ Faculty of History
- ❑ Faculty of Philology
- ❑ Faculty of Economics
- ❑ Faculty of Management
- ❑ Faculty of Law
- ❑ Faculty of Linguistics and Translation
- ❑ Faculty of Oriental Studies
- ❑ Faculty of Ecology
- ❑ Faculty of Journalism
- ❑ Faculty of Psychology and Pedagogics
- ❑ Faculty of Economics, Business Branches and Administration

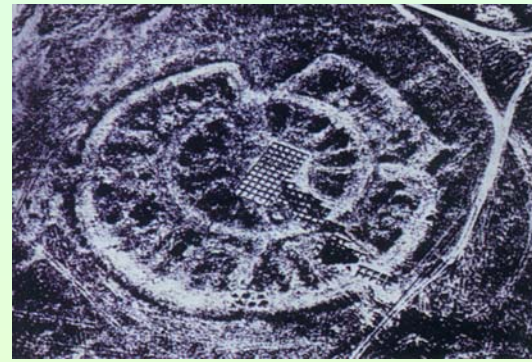


# Leading research schools

- ✓ Algebra and Mathematical Physics.
- ✓ Crypto.
- ✓ Liquids and Gases Mechanics.
- ✓ Laser Physics.
- ✓ Synthesis of Organic Compounds.
- ✓ Immunology.
- ✓ Study of Ecosystems.
- ✓ Regional Economy and Management.
- ✓ Intercultural Communication.
- ✓ Studies of the East.
- ✓ Archaeology and Ethnography.
- ✓ Folklore.
- ✓ Education Quality Management.
- ✓ Access to Higher Education.

# ARKAIM

*Arkaim is a unique prototown,  
its age is more than 4  
thousand years, the town  
was found by CSU scientists  
in 1987.*



# **Integration into Russian Academy of Sciences**

- ✓ **Information and telecommunication technologies and electronics.**
- ✓ **Space and aviation technologies.**
- ✓ **New materials and chemical technologies.**
- ✓ **Weapons of future, military and special machines.**
- ✓ **Industrial technologies.**
- ✓ **Technologies of the living systems.**
- ✓ **Ecology and efficient nature use.**
- ✓ **Energy-saving technologies.**

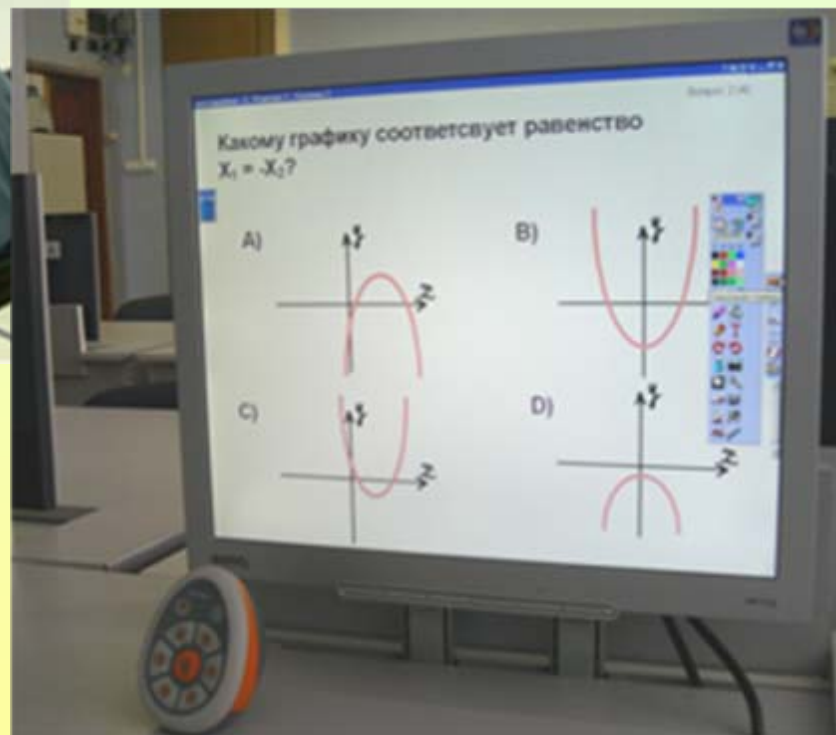


# **International cooperation**

- ✓ **International Association of Universities at UNESCO**
- ✓ **European Network of Access to Higher Education**
- ✓ **Representatives of the European Foundation on Support of Research (INTAS)**
- ✓ **(European Diploma Supplement) for institutions of higher education**
- ✓ **Academic process with use of credits and modules.**
- ✓ **Collaboration agreements with universities in France, the Great Britain, Germany, the Netherlands, China, Turkey, Egypt, Syria, the USA, etc.**



Internet-lecture at the room of training information technologies for people with special needs



Tests system



Room for deaf students



A lesson at the room for students with hearing loss





Special computer room for people  
with special needs





Video-conference with universities within the PEN-Russia project



Lecture at the Faculty of Management

Основное меню

- Новости сайта
- Научная Библиотека ЧелГУ
- Зачётка

В соответствии с доступными

Разработка решения

Системы и технологии

Основы наук

Введение в

Хозяйственные

Теория организации

Экономические

Экономика

Экономические

Экономика

Введение в

Математика

Английский язык

Философия

Немецкий язык

Отечественная

Математика

ДО » Матем » Ресурсы » Учебное пособие. Часть 1

Ухоботов В.И., Белов Е.Г., Тырсин А.Н.

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Тема 7. ЛИНЕЙНАЯ ЗАВИСИМОСТЬ ВЕКТОРОВ, БАЗИС

**Определение.** Вектор  $\vec{y} \in R^n$  называется *линейной комбинацией* векторов  $\vec{x}_1, \vec{x}_2, \dots, \vec{x}_k$  из  $R^n$ , если существует набор чисел  $c_1, c_2, \dots, c_k$ , такой, что

$$\vec{y} = c_1 \vec{x}_1 + c_2 \vec{x}_2 + \dots + c_k \vec{x}_k.$$

**Определение.** Говорят, что векторы  $\vec{x}_1, \vec{x}_2, \dots, \vec{x}_k \in R^n$  являются *линейно зависимыми*, если существует ненулевой набор чисел  $c_1, c_2, \dots, c_k$ , такой, что

$$c_1 \vec{x}_1 + c_2 \vec{x}_2 + \dots + c_k \vec{x}_k = \vec{0}. \quad (1)$$

Если равенство (1) возможно только когда все числа, равны нулю, то векторы  $\vec{x}_1, \vec{x}_2, \dots, \vec{x}_k$  называются *линейно независимыми*.

**Пример.** Рассмотрим векторы

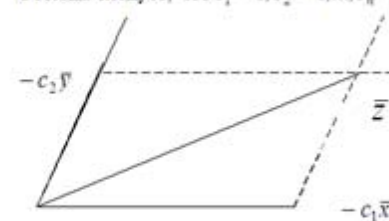
$$\vec{e}_1 = \begin{pmatrix} 1 \\ 0 \\ \vdots \\ 0 \end{pmatrix}, \vec{e}_2 = \begin{pmatrix} 0 \\ 1 \\ \vdots \\ 0 \end{pmatrix}, \dots, \vec{e}_n = \begin{pmatrix} 0 \\ 0 \\ \vdots \\ 1 \end{pmatrix}$$

и покажем, что они линейно независимы. Действительно, запишем для них равенство (1)

$$c_1 \begin{pmatrix} 1 \\ 0 \\ \vdots \\ 0 \end{pmatrix} + c_2 \begin{pmatrix} 0 \\ 1 \\ \vdots \\ 0 \end{pmatrix} + \dots + c_n \begin{pmatrix} 0 \\ 0 \\ \vdots \\ 1 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ \vdots \\ 0 \end{pmatrix}.$$

Отсюда следует, что  $c_1 = 0, c_2 = 0, \dots, c_n = 0$ .

**Пример.** Любые три вектора  $\vec{x}, \vec{y}, \vec{z}$  на плоскости являются линейно зависимыми (см. рисунок).



**Теорема.** Любые  $m$  векторов в  $R^n$  при  $m > n$  являются линейно зависимыми.





## Pre-university training for people with special needs





Adaptation work with people with special needs



Business game at the Center for People with Special Needs





Sports contest at the Center for People with Special Needs





Opening of the Education and Recreation Complex for at the People with Special Needs



Individual scholarships handing to CSU  
students with special needs BY  
representatives of URALSIB Bank







Equal Possibilities is the best social project of 2007,  
CSU and URALSIB Bank



Visit of A.A.Fursenko, the Minister for Education of Science of Russia, to the Center 24  
for People with Special Needs





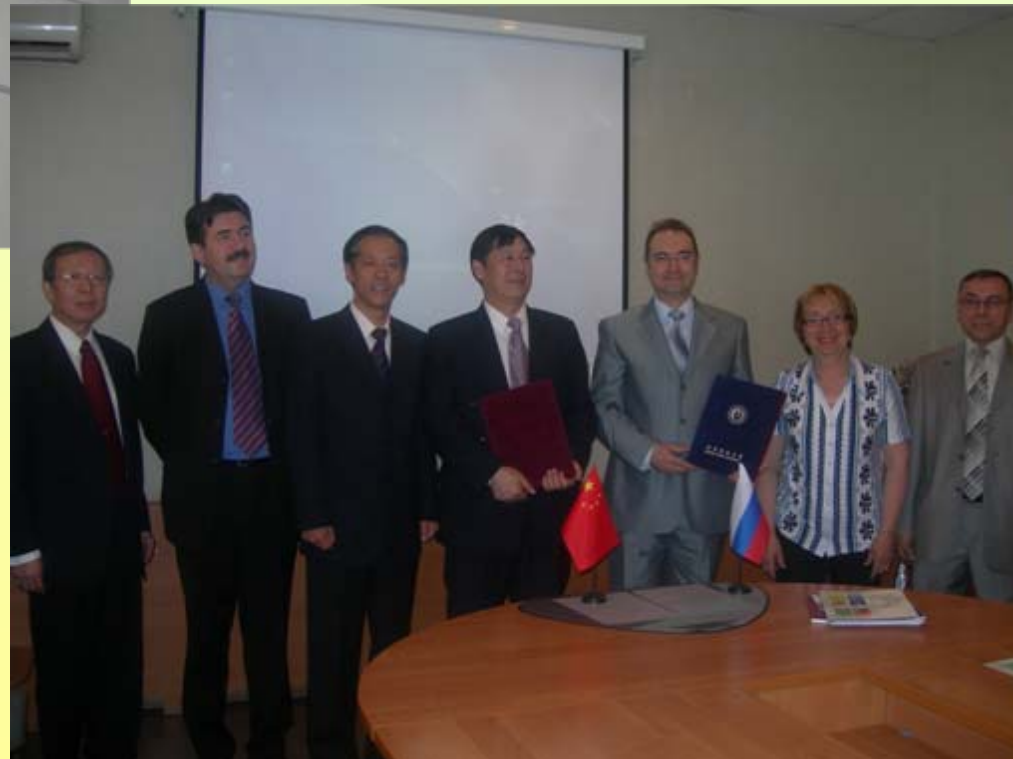
V.A. Sadovnichy, Rector of the Moscow State University visit to the  
Center for People with Special Needs



European Commission expert visit to the Center for People with Special Needs



Beijing Normal University delegation visit  
to the Center for People with Special Needs







Signing of the Memorandum on CSU  
joining PEN-International project





Receipt of Memorandum by Rector A.Shatin



# Chelyabinsk State University

