IV INTERNATIONAL TOURNAMENT MATHEMATICS WITHOUT BORDERS

FINAL 2017

The final round of the Fourth International Tournament *Mathematics without Borders*, organized by *Education without Borders* Pedagogical Association (Bulgaria) and *Innovation* Science & Education Center (Kazakhstan) was held from 1 to 3 July 2017, in the town of Nessebar, under the patronage of the Mayor of Nessebar Mr. Nikolay Dimitrov.

More than 1200 students from 11 countries (Azerbaijan, Bulgaria, Hong Kong, Kazakhstan, Kyrgyzstan, Macedonia, Malta, Romania, Russia, Turkey and Uzbekistan) participated in the final after three preliminary rounds held during the school year.

Before the contest began, the students had a chance to hear greetings from the Mayor of Nessebar Mr. Nikolay Dimitrov, from the Minister of Education and Science Mr Krasimir Valchev, from His Excellency Mr Temirtay Isbastin, the Ambassador of Kazakhstan, from Her Excellency Mrs Nargiz Gurbanova, the Ambassador of Republic of Azerbaijan.

The participants were also greeted by Mrs Alexandra Dergacheva, the vice-consul at the Consulate-General of Russia in Varna.

The individual contest lasted for an hour and consisted of 20 math problems with open and optional answers, and the team contest lasted for 45 minutes, during which the teams of students solved 5 problems in the form of a mathematical relay (the answer to each problem was used in the condition of the following problem).

All participants were given welcome gifts from the organizers and Bulgarian companies Musala Soft, Kubeti and Bachkovo. Apart from getting their trophies, all winners received presents from Telenor and OMV – Bulgaria.


MALTA
HONG KONG
BULGARIA
MALTA
MALTA
MALTA


TURKEY
KYRGYZSTAN


BULGARIA
HONG KONG


ВНИМАНИЕ!!!


ВНИМАНИЕ!!!

The most successful representatives of each country were awarded the title Math Star of the Tournament:

Rasulzade Banu Zaur (Azerbaijan), **Bozhidar Danchev Dimitrov** (Bulgaria), **Ognyan Boykov Ognyanov** (Bulgaria), **Veselin Nikolaev Markovich**(Bulgaria), **Chan Man Ching** (Hong Kong), **Bekshenova Aliya** (Kazakhstan), **Akhmet Rolan** (Kazakhstan), **Ilim Stankulov** (Kyrgyzstan), **Jovan Petar Petrov** (Macedonia), **Zehra Ebibi** (Macedonia), **Eric Bader** (Malta), **Andrei Robert Ion** (Romania), **Khrapskaia Stefaniia** (Russia), **Erbayraktar Duygu** (Turkey), **Rizaev Kamal** (Uzbekistan).

For the second year in a row **Bozhidar Danchev Dimitrov** (Silistra, 6) was awarded t**he grand prize "Winner amongst Winners"** by the Mayor of Nessebar, Mr Nikolay Dimitrov**.**

The award for contribution to the development of the tournament was given to **Galina Belyanskaya** from Kazakhstan by the Mayor of Nessebar Municipality.

27 teachers were awarded a plaque to recognize their contribution to the tournament: Aliyeva Shahla (Azerbaijan, Baku), **Dora Zamfirova Kraycheva** (Bulgaria, Isperih), **Diyana Petrova Dimitrova** (Bulgaria, Varna), **Nelka Pencheva Peeva** (Bulgaria, Sofia), **Zhelyazko Hristov Chapkanov** (Bulgaria, Svilengrad), **Stanka Georgieva Aleksandrova** (Bulgaria, Burgas), **Ivan Bonev Georgiev** (Bulgaria, Plovdiv), **Velizar Krumov Kitov** (Bulgaria, Kazanlak), **Margarita Kostadinova Savova** (Bulgaria, Silistra), **Antoaneta Sharkova** (Bulgaria, Dimitrovgrad), **Galia Georgieva Tsvetanska** (Bulgaria, Plovdiv), **Evelina Hranova** (Bulgaria, Sofia), **Irina Ralinova Cholakova**(Bulgaria, Smolyan), **Chan Sun Keung Kirk** (Hong Kong), **Aileen Dacumos** (Kyrgyzstan, Bishkek), **Atanas Nanchev** (Macedonia, Bogdanci), **Adrijana Todorova** (Macedonia, Bogdanci), **Velika Karagosheva** (Macedonia, Gevgelija), **Xhezi Kamberi** (Macedonia, Gostivar), **Melanie Casha Sammut** (Malta, Pembroke), **Viktoriya Yurkova** (Russia, Moscow, **Gulcur Goker** (Turkey, Izmir), **Kuchkarova Marina Pavlovna** Uzbekistan, Andijan), **Darvisheva Dilbarzhon Abdurasulovna** (Uzbekistan, Namangan), **Alisher Ikramov** (Uzbekistan, Tashkent), **Bannova Nataya Aleksandrovna** (Uzbekistan, Tashkent), **Nazarova Muxsinaxon Toxtamurodovna** (Uzbekistan, Tashkent).

Gold Cups and laurel wreaths were awarded to the winners:

Victoria Ivanova Petkova (Bulgaria, Burgas, 1), **Khrapskaia Stefaniia** (Russia, Moscow, 1), **Maria Cassia Lyudmilova Petrova** (Bulgaria, Sofia, 2), **Usmanbekov Saidakbar** (Uzbekistan, Tashkent, 2), **Ognyan Boykov Ognyanov** (Bulgaria, Sofia, 3), **Abdurashidov Doston** (Uzbekistan, Andijan, 3), **Veselin Nikolaev Markovich** (Bulgaria, Varna, 4), **Petar Ivanov Uzunov** (Bulgaria, Plovidv, 4), **Jasen Plamenov Penchev** (Bulgaria, Gabrovo, 5), **Deyan Deyanov Hadzhi-Manich** (Bulgaria, Varna, 5), **Andrei Robert Ion** (Romania, Bucharest, 5), **Bozhidar Danchev Dimitrov** (Bulgaria, Silistra, 6), **Bekshenova Aliya** (Kazakhstan, Almaty, 6), **Georgi Stefanov Zlatinov** (Bulgaria, Blagoevgrad, 7), **Yoan Naydenov Naydenov** (Bulgaria, Sofia, 8), **Lyubomira Petkova Dimitrova** (Bulgaria, Svishtov, 9), **Zehra Ebibi** (Macedonia, Gostivar, 9).

Silver Cups and laurel wreaths were awarded to:

Valentin Nikolaev Stanchev (Bulgaria, Dimitrovgrad, 1), **Deyan Georgirev Georgiev** (Bulgaria, Sofia, 1), **Ismailov Dalyer** (Russia, Tashkent, 1), **Aripova Elizaveta** (Uzbekistan, Tashkent, 1), **Monika Stanimirova Ilieva** (Bulgaria, Sofia, 2), **Martin Diyanov Dimitrov** (Bulgaria, Varna, 2), **Dimana Pramatarova** (Bulgaria, Plovdiv, 3), **Akhmet Rolan** (Kazakhstan, Atyrau city, 3), **Demira Georgieva Nedeva** (Bulgaria, Plovidv, 4), **Daniel Yordanov Adamov** (Bulgaria, Varna, 5), **Eric Bader** (Malta, Pembroke, 5), **Rizaev Kamal** (Uzbekistan, Tashkent, 6), **Margulan Erlanovich Ismoldaev** (Bulgaria, Varna, 6), **Aleksandar Plamenov Prodanov** (Bulgaria, Kazanlak, 7), **Jovan Petar Petrov** (Macedonia, Gevgelija, 7), **Fayzullaev Bakhtiyor** (Uzbekistan, Tashkent, 8), **Atanas Manolov Semov** (Bulgaria, Plovdiv, 8), **Spasiyan Ivanov Todorov** (Bulgaria, Sofia, 9).

Bronze Cups and laurel wreaths were awarded to:

Rasulzade Banu Zaur (Azerbaijan, Baku, 1), **Abdurashidov Rahmatulloh** (Uzbekistan, Andijan, 2), **Preslava Dobrinova Dobreva** (Bulgaria, Sliven, 3), **Ilim Stankulov** (Kyrgyzstan, Bishkek, 3), **Lazar Ivanov Todorov** (Bulgaria, Sofia, 4), **Yakhyoev Ubay** (Uzbekistan, Tashkent, 4), **Erbayraktar Duygu** (Turkey, Izmir 4), **Kul-mukhammed Anuar** (Kazakhstan, Almaty, 5), **Ivan Ivelinov Bogdanov** (Bulgaria, Silistra, 6), **Maitekov Daniyal**(Kazakhstan, Almaty, 6), **Atanas Stoyanov Hrisulev** (Bulgaria, Burgas, 7), **Tokhirzoda Akbar** (Uzbekistan, Tashkent, 7), **Georgi Tsvetelinov Ignatov** (Bulgaria, Vratsa, 7), **Mark Martinov Kirichev** (Bulgaria, Varna, 8), **Tanja Borche Lazarova** (Macedonia, Bogdanci, 8), **Zlatina Todorova Mileva** (Bulgaria, Varna, 10).

Welcome again next year!

TIME SCHEDULE

2017-2018

Autumn round – 16 – 25 October 2017;

Winter round – January 29, 2018 – February 7, 2018

Spring round – 19 – 31 March 2018

Final - Nessebar, Bulgaria – 29 June – 2 July 2018

MATHEMATICS WITHOUT BORDERS

INTERNATIONAL TOURNAMENT

1. The tournament is for students aged 8 to 18 years, who will be divided into nine age groups.

Group 1 – 7-8-year-old students

Group 2 – 8-9-year-old students

Group 3 – 9-10-year-old students

Group 4 – 10-11-year-old students

Group 5 – 11-12-year-old students

Group 6 – 12-13-year-old students

Group 7 – 13-14-year-old students

Group 8 – 14-15-year-old students

Group 9 – 15-18-year-old students

2. The tournament is held remotely in three rounds and ends with a final contest in Bulgaria.

Autumn round – in October

Winter round – in January

Spring round – in March

Final – in June - July

3. In the three preliminary rounds the participants will compete either in their home school (if there are a minimum of 10 students) or in a partner school in the same area, on a day selected by the school (the day must be chosen from the calendar period).

4. Each round of the tournament is held in the form of a test for each group, which will last 60 minutes.

The number of problems in the test is 20, 10 of which have a multiple-choice answer and 10 have

an open answer. *(The students from Group 1 solve only 10 problems in the Winter round.)*
The problems are composed by a team of specialists and consultants and are in accordance with the curriculum content for the respective age groups in different countries *(Appendix 1 – MWB Syllabus).*
The tests are available in the official languages of the tournament: Bulgarian, English, Russian and Kazakh. If necessary the schools in the different countries should provide translations of the test in the language that is required by the participants.
The use of calculators and other digital devices (mobile phones, etc.) is not allowed. Students who take the test in a language other than their mother tongue, can use a dictionary.

5. Each participating school (or each partner school for the respective area / country), must email an application for participation *(Appendix 2 – Application Form)* no later than 3 days before the start of each remote round of the tournament to: mwb_en@abv.bg and mwb_en@mathematicalmail.com

6. For each of the rounds the school must transfer the registration fee for each student in the form of a donation, to the bank account provided by the organisers. The funds received are used by the organisers for composing the competition tests; for their translation into the official languages of the competition; for processing of the results and for ranking; for providing certificates and medals; for postage and for other organisational activities.

7. Before each remote round, the organisers will send the tests for each age group, the answer key, an answer sheet and a sample result report.

8. The participating school (or the partner school for the respective area / country) must choose a convenient for them day and hour from the calendar period for each round and must then carry out the competition whilst providing an atmosphere of fairness and honesty.
The marking will be carried out by committees in the schools where the competition takes place.
Each correctly solved problem from 1 to 10 is worth 1 point, and each correctly solved problem from 11 to 20 is worth 2 points *(if a problem has 2 or more answers: 1 point for a partial answer, 2 points for a complete answer).* Total number of points: 30.
The results are filled in the report form which must be sent to: mwb_en@abv.bg and mwb_en@mathematicalmail.com no later than three days after the competition has been held.
The test report should be provided for the information of the competitors and their parents.
The schools where the competition has been held must keep hold of the competition papers until the final round of the tournament.

9. The ranking for each round is separate, and is carried out according to age groups.
The ranking is carried out according to the number of solved problems (points earned).
In the case of an equal number of solved problems, the higher ranked participant will be the one who has spent less time solving the problems.
The ranking will be announced no later than 10 days from the end of the competition period and will be published on the website of the tournament: www.mathematicalmail.com.

10. The prizes for each remote competition are gold, silver and bronze medals, and certificates for all participants.
The prizes will be sent to the address provided by the participant (full name of the recipient, institution, number, street, place of residence, postcode) within 30 days of the conduct of each of the preliminary rounds.
The number of students who receive medals in each competition will be up to 20% of the total number of participants - 4% will receive gold medals, 8% - silver and 8% - bronze.
After the completion of the three preliminary rounds of the tournament, the teachers who have been involved in it will receive a partnership certificate.

FINAL ROUND

11. Participation quotas for the finals in Bulgaria will be announced on the web site of the tournament after the second round.
Travel and accommodation in the town of Nessebar, Bulgaria, for students who will participate in the final competition and their teachers and / or parents will be at the expense of the participants.
For those who are unable to arrive in Bulgaria, there will be an opportunity for a remote participation in the tournament final.

12. The finals consist of two different contests – individual and team, held over the course of two days.

13. The number of problems in the individual contest is 20, 10 of which have a multiple-choice answer and 10 have an open answer. Each correctly solved problem from 1 to 10 is worth 1 point, and each correctly solved problem from 11 to 20 is worth 2 points.

14. The team contest takes the form of a mathematical relay consisting of 5 problems for each age group. The solution to each problem is used to solve the following problem. Each team, consisting of three students of the same age group, must solve the problems in 45 minutes and then fill a common answer sheet.
The first correctly solved problem is worth 5 points, the second – 4 points, the third – 3 points, the

fourth – 2 points and the fifth – 1 point.

15. The contest papers are available in the official languages of the tournament: Bulgarian, English, Russian and Kazakh. If necessary the schools in the different countries should provide translations in the language that is required by the participants.
Calculators are not allowed. Students who take the test in a language other than their mother tongue, can use a dictionary.

16. The participants who take the top three places in each age group in the final individual competition and in the team competition will receive gold, silver and bronze medals (the total number of medal holders will be 20% of the total number of the finalists from each age group).
The ranking is carried out according to the number of solved problems (points earned). In the case of an equal number of solved problems, the higher ranked participant / team will be the one that has spent less time solving the problems.

17. The ranking for the *Mathematics without Borders* Cups will be determined based on the sum of the two best results of the three remote rounds and the doubled result of the final competition. The three most successful students from each age group and country will be included in the ranking for the Tournament Cups.
The participants who hold first place in each age group will receive the *Mathematics without Borders* Golden Cup, those who hold second place will receive the *Mathematics without Borders* Silver Cup and those who hold third place will receive the *Mathematics without Borders* Bronze Cup. All cup holders will be awarded laurel wreaths.

18. Special prizes and the title *Math Star of the Tournament* will be received by each country's most successful contestant.

19. The Mayor of Nessebar, a patron of the tournament, will reward the most successful contestant and the teacher with the highest contribution to the tournament.

20. The teachers from all participating countries with the greatest contribution to the promotion of the tournament will be awarded by the organisers.

Mathematics without Borders
SYLLABUS

Age group	Round	Topics added to those included in previous rounds/grades
1	Winter	Addition and subtraction of numbers up to 20.
	Spring	Shapes: triangle, rectangle and square. Meter, decimeter, centimeter. Money.
2	Autumn	Numbers from 21 to 100 (reading, writing, addition and subtraction). Comparison of the numbers up to 100. Kilogram. Time. Meter, decimeter, centimeter. Perimeter of a triangle, rectangle and square. Magical square.
	Winter	Multiplication of single digit numbers by numbers up to 10. Division of numbers up to 100 by numbers up to 10. Day, week, month, year. Counting (e.g. no. of ways to choose 2 objects from 5 objects). Simple logic problems.
	Spring	Multiplication and division by single digit numbers. Addition and subtraction of numbers up to 100. Types of triangles: equilateral, isosceles, scalene. Square, rectangle, segment. Number sequences and patterns. Simple cryptarithms.
3	Autumn	Addition, subtraction, comparison of numbers from 101 to 1,000. Kilometer, meter. True/false statements.
	Winter	Multiplication and division of two-digit numbers. Angles: sharp, straight, and obtuse. Types of triangles according to the angles. Solving problems starting from the end (“backwards design”).
	Spring	Multiplication and division of three-digit numbers. Finding an unknown addend, minuend, multiplier, divisor and dividend. Divisor, dividend, quotient and remainder. “Guess and check” problem-solving technique.
4	Autumn	Numbers greater than 1,000. Roman numerals. Addition and subtraction of numbers greater than 1,000. Multiplication and division of numbers greater than 1,000 by a single-digit number.
	Winter	Multiplication and division of numbers greater than 1,000 by a two-digit number.
	Spring	Shapes: circle, rectangle, square. Area of a rectangle and a square. “Extreme principle” problem-solving technique.
5	Autumn	Prime and composite numbers.

		Divisibility rule. Common factor. Greatest common factor (GCF). *Dirichlet's Box Principle.*
	Winter	Geometric shapes - triangle, quadrilateral parallelogram, rectangle, rhombus, square. Sum and difference of segments.
	Spring	Simple fractions. Decimals. Addition, subtraction, multiplication and division of simple fractions and decimals. Infinite periodic decimals. Addition, subtraction, multiplication and division of infinite periodic decimals.
6	Autumn	*Exponentiation.* Percentage. Rational numbers. Real axis.
	Winter	Negative numbers. Sets. Union of sets. Intersection of sets. Combinatorics. Combinations, permutations.
	Spring	Circle. Circumference. Area of a circle. Proportions. Polynomials. Addition, subtraction and multiplication of polynomials.
7	Autumn	Short multiplication formulas. Factoring.
	Winter	Linear equations. Venn diagrams. Verbal problems – making up a math model, solving the equations.
	Spring	Congruent triangles. Linear inequalities.
8	Autumn	Irrational numbers. Square root. Converting irrational expressions. Diophantine linear equations.
	Winter	Midsegment of a triangle. Centroid of a triangle. Quadratic equations. Equations, which are reduced to quadratic equations. Graph of a linear function. Direct and inverse variation.
	Spring	Parallelogram. Rectangle. Rhombus. Square. Circle – arcs and central angles; inscribed angles; angles whose sides intersect a circle. Circumcircle and incircle of a triangle. Inscribed and circumscribed polygons. Systems of linear equations and inequalities.
9	Autumn	Irrational equations.
	Winter	Systems of quadratic equations. Similar triangles.
	Spring	Vieta's formulas. Pythagorean theorem.

APPLICATION FORM **Date:.....**

<table>
<tr><td>Mailing address
(where prizes and certificates can be sent)
recipient:
street address:
postal code, city/town:
country:</td><td></td></tr>
<tr><td>E-mail address:
(where the contest materials can be sent)</td><td></td></tr>
<tr><td>Full name and phone number
(Viber, WhatsApp or Messenger if available)
of the person in charge:</td><td></td></tr>
<tr><td>Payment:</td><td>Made on ..... (date); amount: $/€ .....
Will be made on …….; amount: $/€ .....</td></tr>
<tr><td>Data for an invoice:
(if needed)</td><td></td></tr>
<tr><td>Number of participants</td><td><table>
<tr><th>Age group</th><th>Number of students</th></tr>
<tr><td>1</td><td></td></tr>
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<tr><td>Total number:</td><td></td></tr>
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<tr><td>Chosen date for holding the contest:</td><td></td></tr>
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A text that each participant in the "Mathematics without Borders" tournament should read before participating in the tournament

(adopted at the closing session of the Forum "Mathematics without Borders - motives, implementation, ambition," held from 27 to 30 August 2014 in Sunny Beach, Bulgaria)

A promise of fair competition

"As a participant in the tournament," Mathematics without Borders ", I promise

- to abide by all rules of the tournament;
- to keep the spirit of fairness by working independently;
- to do my best and to strive to improve my performance;
- to strive to obtain new knowledge and skills before, during and after each competition.

I will compete to help promote the establishment of the Olympic spirit in the mathematics competitions, by protecting:

- my honor;
- the honor of the school I represent;
- the honor of the country I represent. "

Participation fee for each remote round

Number of participants	Fee per student paid by bank transfer to the organizers
From 10 to 20	$15 (US Dollars) or €14 (EUR)
From 21 to 50	$13 (US Dollars) or €12 (EUR)
From 51 to 100	$ 11 (US Dollars) or €10 (EUR)
Over 100	$ 10 (US Dollars) or €9 (EUR)

Final Round	Fee per student
Individual competition	€50 (EUR)
Team competition	€15 (EUR)

Bank account details:

USD Beneficiary's account number (IBAN) **EUR** Beneficiary's account number (IBAN)	**BG49FINV91501016226631** **BG04FINV91501016146931**
BIC	**FINVBGSF**
Bank's name	First Investment Bank
Bank's address	First Investment Bank AD 37, Dragan Tsankov Blvd. 1797 Sofia
Beneficiary's name	*Education without Borders* Pedagogical Association
Beneficiary's address	90 Rakovski Str. Stara Zagora 6000, Bulgaria