IAVM

ANNOUNCING

INTERNATIONAL VEDIC MATHEMATICS OLYMPIAD (IVMO)

Dear VM Enthusiast,

The IAVM (Institute for the Advancement of Vedic Mathematics) will be running a competition in September 2020, the IVMO.

It is an international competition that tests ability and speed in using Vedic mathematics techniques and their application in problem solving. There are four levels for the Olympiad: Primary, Junior, Intermediate and Senior. On the day of sitting (12th September, 2020) valid entries are as follows:

Primary - 11 years and under
Junior - 13 years and under
Intermediate - 16 years and under
Senior - 18 years and under.

The Olympiad will be run at Regional Centres, in any country, under the supervision of Regional Coordinators. If you wish to have students participating in this global event then we invite you to become a Regional Coordinator. This letter of invitation is being sent now so that students can be trained in the Vedic Maths techniques in good time.

There will be award certificates of Bronze, Silver and Gold, issued by the IAVM, for the top 60% (globally) in the ratio 3:2:1. Adults, and anyone outside the intended age brackets, may also sit the Olympiad but will not be included in the student certification.

If you are interested in participating as a Regional Coordinator then please read the details below of how the Olympiad will be implemented and register your interest with us, email:instituteavm@gmail.com, preferably by the end of December 2019. This will enable us to advertise the Regional Centres in good time. You will not need to inform us of the number of participants at this stage. If you register as a Regional Coordinator you will be required to administer the Olympiad test under exam conditions. With your permission we will publish your contact details and location on our website so that anyone interested can get in touch.

How it Works

1. Once registered, Regional Coordinators (RCs) will be sent full sample papers with answers.
2. RCs will be emailed the Olympiad tests and markschemes a few days before the set date.
3. They print out sufficient numbers of tests.
4. Children (students) sit the test under strict exam conditions.
5. RCs then mark the papers according to the markscheme and email back to IAVM the results on a prepared spreadsheet.
6. IAVM collates the results and awards certificates.

The Olympiad can be organised and run either through schools or through private Regional Coordinators.

Further details are set out below.

The trustees of IAVM look forward to welcoming you as a Regional Coordinator for this exciting new event which we plan to run every year.

With kind regards

James Glover (Chair)

Fees

For registering as a regional coordinator.

India - INR 1000	Great Britain - £15	Japan - JPY 2000
Philippines - PHP 1000	USA - $20	Australia - AUD 30
South Africa - ZAR 300	Europe - €18	Nigeria - NGN 4000

Fees for participants are as follows:

India - INR 200	Great Britain - £4	Japan - JPY 500
Philippines - PHP 250	USA - $5	Australia - AUD 7
South Africa - ZAR 30	Europe - €4.50	Nigeria - NGN 1000

Entry fees for other countries can be provided on enquiry. Regional Coordinators will retain 20% of the entry fee and return the balance to IAVM.

Languages

If you wish to have the Olympiad in an alternative language from English, then arrangements can be made for the worded questions through an appendix.

Structure

Each Olympiad test contains 40 questions to be sat in one hour. 2 marks will be awarded for correct answers to questions 1 - 20 and 3 marks per question thereafter. Each test is structured so that (approximately) the first 20 questions test arithmetic ability using the Vedic maths techniques, the next 10 questions test the application of those techniques and the final 10 questions are problems.

Topics

The list of topics for each Olympiad is set out below. The lists are cumulative, for example, students entering the Senior Olympiad will need to be familiar with all topics in the other Olympiads. Most resources as well as courses for students and teachers are available at www.vedicmaths.org.

Primary Topics
Addition of numbers by casting out 10s
Divisibility test for 9
Subtraction of numbers
Nikhilam multiplication, base 100, below the base, above the base, above and below the base
Finding digital roots by casting out 9s
Multiplying and dividing by 5, including decimals, using Proportionately
Squaring 2-digit numbers ending in 5
Multiplying 2-digit numbers, using When the final digits add to 10
Division by 9 and 11
Nikhilam division with divisors, base 100
Fractions: simplifying, addition, subtraction, multiplication, division
Simple word problems using the above
Linear Sequences
Areas of rectangle and triangles
Relative size of fractions

Perimeters of compound shapes
Percentage problems
Lines of symmetry
Counting shapes within a compound shape
Junior Topics
Nikhilam division with divisor base 1000
Fraction calculations with mixed numbers
Converting fractions to decimals using Proportionately
Squaring numbers close to a base
Using Nikhilam multiplication with decimals
Straight division with 2-digit divisors without altered remainders
Multiplication by Vertically and Crosswise, up to 3 by 3 digits
Simple word problems using the above
Solving linear equations with unknown on both sides
Calculating percentages of amounts
Reverse percentages
Using proportionately to compare fractions
Problems involving direct and inverse proportion
Decimal conversions for 9ths and 11ths
Fractions of shapes problems
Finding and using nth term formulae for linear sequences
Solving linear equations involving fractions
Volumes and surface areas of cuboids
Intermediate Topics
Divisibility using composite divisors
Nikhilam multiplication up to base 1000
Paravartya division for numerical divisors up to base 100 and for algebraic binomial divisors
Cubing 2-digit numbers
Square roots of perfect squares of 2-digit numbers
Squaring numbers close to a base 1000
Vertically and Crosswise multiplication with decimals
Converting fractions with denominators ending in 9 into decimals
Convert partially recurring decimals into common fractions
Straight division with decimals
Simultaneous linear equations
Minimum value of a quadratic function by completing the square
Solve quadratics by factorisation with coefficient of x^2 greater than 1.

Use of factor theorem to solve cubic equations
Equation of straight line given gradient and one point
Equation of straight line given two points
Equation of parallel line through one point
Equation of perpendicular line through one point
Points of intersection
Multiplying quadratic functions
Polynomial and numerical division with binomial divisors by Transpose and Adjust
Unique types of quadratics equations
Similar areas and volumes in relation to linear scale factors
Similar shapes involving ratios
Simplifying algebraic fractions involving quadratics
Using last digits to verify calculations
Expressing a number as the difference of two squares
Combined ratios using LCM
Angles in polygons
Negative and fractional indices of numbers
Senior Topics
Left to right calculations for significant figures
Cubing 2-digit decimal numbers
Problems involving the difference of two squares
Number of digits in partially recurring decimals
Product of sums of coefficients in polynomial products
Using first and last terms in polynomial calculations
Completing the square to find radius and centre of a circle equation
Using the difference of two squares in algebraic proof
Factor theorem
Product and Quotient rules for differentiation
Chain rule for differentiation for polynomials
Series expansions using the Binomial theorem for negative and fractional indices
Use of Pythagorean triples to define angles
Addition and subtraction of angles using triples
Geometric problems involving triples including reflections, rotations and distances
Reflections and rotations of points using triples
Areas of shapes on coordinate axes using Product of means minus product of extremes
Use of Discriminant of quadratic functions to detemine number of roots
Definite integration to find area under a curve
Integration with partial fractions resulting in natural log functions

Sample Questions

Primary

3. Subtract

$$\begin{array}{r} 65748 \\ -\,26853 \\ \hline \end{array}$$

4.

$$\begin{array}{r} 96 \\ \times\,91 \\ \hline \end{array}$$

11. Divide $9\overline{)13021}$

12. Divide, $11\overline{)47539}$

23. If you learn 14 verses of scripture per day for each of 25 days, how many verses will you have learnt?

24. A train travels 36 km in 21 minutes. How long does it take to travel 72 km at the same speed?

Junior

5.

$$\begin{array}{r} 107 \\ \times 112 \\ \hline \end{array}$$

6.

$$\begin{array}{r} 106 \\ \times\ 93 \\ \hline \end{array}$$

15. Divide, $879\overline{)101003}$

16. 63×1001

23. How many pieces of wire, each 31 cm long can be cut from a roll of length 100 metres and what will be the remainder?

24. A car park has 23 rows each with 56 cars. How many cars are in the car park?

34. How many different digits are there when $\frac{17}{11}$ is converted to a decimal? (Draw a ring round the correct answer.)

A 2 B 3 C 4 D 5 E 6

Intermediate

3.

$$\begin{array}{r} 683 \\ \times 996 \\ \hline \end{array}$$

4.

$$\begin{array}{r} 1756 \\ \times 1003 \\ \hline \end{array}$$

15. Convert $\frac{116}{125}$ to decimal.

16. Convert the fraction, $\frac{7}{19}$, to decimal, correct to 9 decimal places.

21. If $6x - y = 21$ and $6y - x = 14$, what is the value of $x - y$?

22. Find the minimum value of the function,

$$f(x) = x^2 - 8x + 23$$

Senior

9. Work out 410.2367×201.2785 correct to 2 significant figures.

10. 0.48^3

19. Find the cube root of the exact cube, 238,328

20. Find the constants *a* and *b* given that,

$$(3x^2 - 2x + 7)(4x^2 + ax + b)$$
$$= 12x^4 + x^3 + 16x^2 + 25x - 14$$

27. Find the first three terms in the series expansion for,

$$\frac{8 + x}{(2 - x)^2}$$

28. Differentiate, $(3x^2 + 2x + 1)^7$

Full sample papers with solutions and suggested use of sutras will be available to Regional Coordinators.