INTERNATIONAL OLYMPIAD ACADEMY | IOA

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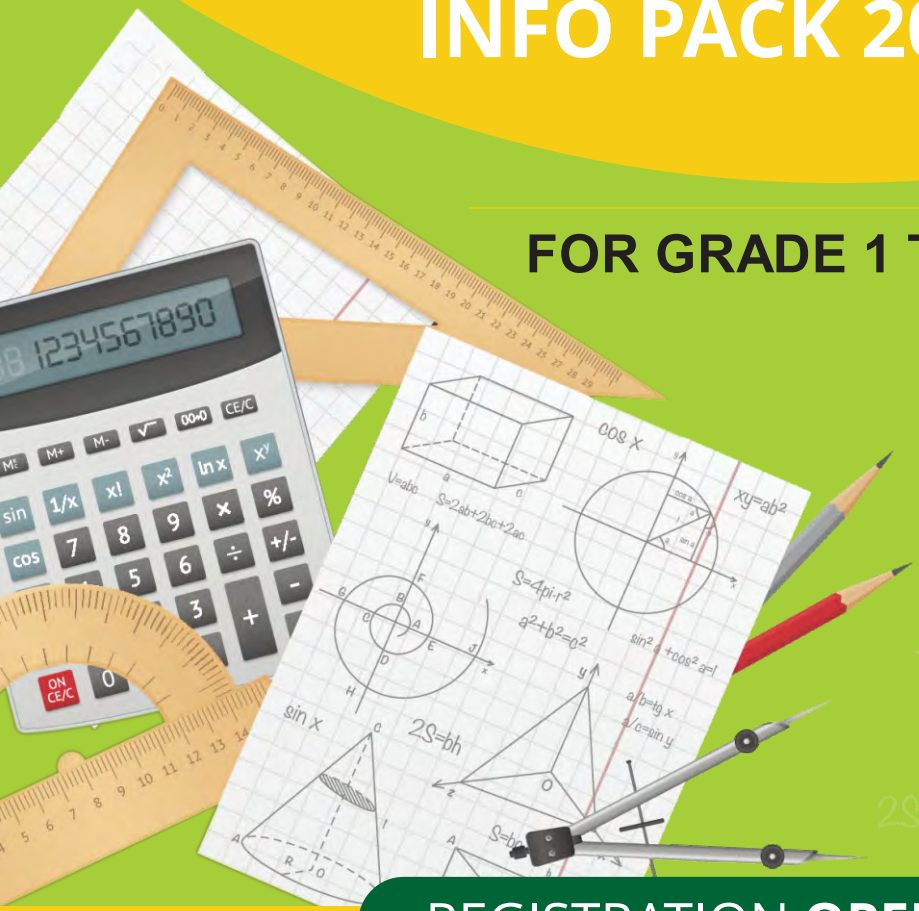
WORLD'S MOST CELEBRATED CONTEST

MATH KANGAROO COMPETITION

INFO PACK 2023-24

FOR GRADE 1 TO 12



REGISTRATION OPEN 2023-24

CONTENT

About the Mathematical Kangaroo Competition

Mathematical Kangaroo is an International Mathematical Competition that started in 1991 in France and is now conducted in 92 countries. There are twelve levels of participation, ranging from 1 to 12 grades. The key competence tested by Mathematical Kangaroo is not just pure knowledge of formulas, but the logical combination of concepts.

The Mathematical Kangaroo aims to spread the love of mathematics, encourage mathematical education in schools, and create a favourable perception of mathematics in society, motivated by the importance of mathematics in the current world. Mathematical questions in the multiple-choice format are available to students at all levels of school. The questions aren't typical textbook problems, and they cover a wide range of topics. They demand imagination, basic computational abilities, logical reasoning, and other problem-solving strategies, in addition to inspiring ideas, perseverance, and creativity.

Categories

Categories	School Level
Pre Ecolier 1 & 2	Grade - 1 & 2
Ecolier 1 & 2	Grade - 3 & 4
Benjamin 1 & 2	Grade - 5 & 6
Cadet 1 & 2	Grade - 7 & 8
Junior 1 & 2	Grade - 9 & 10
Student 1 & 2	Grade - 11 & 12

Exam Format

- This is a 90-minute exam. For Grades 5 to 12, there will be 30 questions worth 120 points, and for Grades 1 to 4, there will be 24 questions worth 96 points. Each question contains five MCQ-based options.
- There are three levels of increasing difficulty in each of the three categories. Based on the level of difficulty, the following points are awarded:

  Section-A (Easy): 3 points for each correct answer.

  Section-B (Medium): 4 points for each correct answer.

  Section-C (Hard): 5 points for each correct answer.
- Pre Ecolier-1 and Pre Ecolier-2 students will take the same test paper but will be ranked separately. Same applies for Ecolier-1 & 2; Benjamin-1 & 2; Cadet- 1&2; Junior-1 & 2 and Student-1 & 2.
- 1 point will be deducted for each incorrect answer, and no penalty for skipping a question.
- During the exam, pencils, pens, erasers, rulers, and other geometrical instruments are allowed.
- Instruments or gadgets like calculators, smart watches, etc. are strictly prohibited.
- The first-round perfect scorer will appear in the final round of competition.

Syllabus

- **PRE-ECOLIER - 1 & 2 (GRADE- 1 & 2)**
  - Simple arithmetic operations with 1 digit and 2-digit numbers
  - Distinguishing simple figures
  - Time, clock. number of days in a week
  - Number of months in a year

- **ECOLIER – 1 & 2 (GRADE- 3 & 4)**
  - Simple arithmetic operations with 1,2,3 and 4-digit numbers
  - Recognizing geometric figures.
  - A magic square with a sum of 15
  - Time, clock. number of days in a week, number of months in a year
  - Addition, subtraction, multiplication, division. intersection of sets
  - Perimeter and area of a square, a rectangle

- **BENJAMIN- 1 & 2 (GRADE- 5 & 6)**
  - Addition, subtraction, multiplication, division.
  - Magic squares
  - Fractions and decimals.
  - Clock, a calendar
  - Perimeter of a polygon. area of a rectangle and a triangle
  - Mathematical logic.
  - Lines and rays on a surface
  - A cube, a rectangular solid. Acute, right, and obtuse angles.

- **CADET – 1 & 2 (GRADE – 7 & 8)**
  - Operations on rational numbers
  - Powers of natural numbers
  - Angles: acute, right, and obtuse
  - Equations, inequalities and systems of linear equations
  - Area of a rectangle, a triangle and a circle
  - Lines and rays on a surface
  - Volume and surface area of geometric figures
  - Supplementary angles, sum of angles in a triangle and in a quadrilateral
  - Mathematical logic

- **JUNIOR – 1 & 2 (GRADE - 9 & 10)**
  - Operations on real numbers
  - Functions, polynomials, equations, inequalities.
  - Sequences of numbers
  - Elements of combinatorics
  - Synthetic & analytic plane geometry

- **STUDENT – 1 & 2 (GRADE – 11 & 12)**
  - Simple arithmetic operations with 1,2,3 and 4-digit numbers
  - Operations on real numbers
  - Functions, polynomials, equations, inequalities.
  - Sequences of numbers
  - Elements of combinatorics
  - Synthetic & analytic plane geometry

Awards

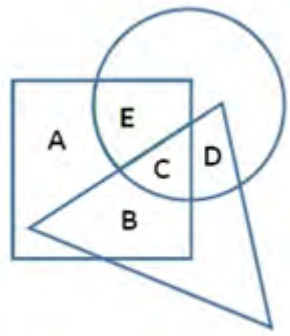
- Gold medals will be awarded to the top 5% of competitors; silver medals will be awarded to the next top 10% of competitors, and bronze medals will be awarded to the next top 10% of competitors. All medalists will be presented with merit certificates. Others will receive a participation or appreciation certificate.
- Only an e-certificate will be given for appreciation and participation.
- In the final round of competition, the first-round perfect scorer will compete. Students who score higher than 95% in the final round will receive a Perfect Score Certificate, a Gold Medal, and $100 in cash.

Sample Questions

PRE-ECOLIER - 1 & 2 (GRADE- 1 & 2)

SECTION – A (3 POINT PROBLEMS)

1. On the water surface of an aquarium is marked a circle, a triangle, and a square (fig.). Dolphin Kay emerged from the water in a place that was both in the square and in the circle. Which area did he emerge from?



(A) A
(B) B
(C) C
(D) D
(E) E

Answer:-(B)

SECTION – B (4 POINT PROBLEMS)

2. In a shopping competition, the winner is the one who spends the amount of money that is closest to the value of 80 $. Which of the following competitors is the winner?

(A) MARY
(B) ANN
(C) LUCY
(D) ADAM
(E) ROBERT

Answer:-(D)

SECTION – C (5 POINT PROBLEMS)

3. Every guest invited to the Snow palace for a ball came there on their individual sleigh. The colours of the sleighs, as they were pulling up to the palace, were changing regularly: red, yellow, blue, red yellow ... All red sleighs were pulled by one reindeer, all yellow sleighs by two reindeers and all blue sleighs by three reindeers. Altogether there were 15 reindeers that pulled sleighs to the castle. How many guests came to the palace?

(A) 9 (B) 8 (C) 7 (D) 6 (E) 5

Answer:-(B)

Sample Questions

ECOLIER – 1 & 2 (GRADE- 3 & 4)

SECTION – A (3 POINT PROBLEMS)

1. Joe's favourite brand of cereal is on sale so he's going to buy as much as he can. He fills two reusable shopping bags with three more shopping bags each and heads to the shop. If every bag can fit four boxes of cereal, how many boxes can Joe pack in the bags altogether?

(A) 20 (B) 24 (C) 28 (D) 32 (E) 36

Answer:-(D)

SECTION – B (4 POINT PROBLEMS)

2. The picture below shows three kinds of wooden blocks coloured in yellow, purple and green. They are used to form a cube as shown in the figure below. How many green wooden blocks are being used?

(A) 19

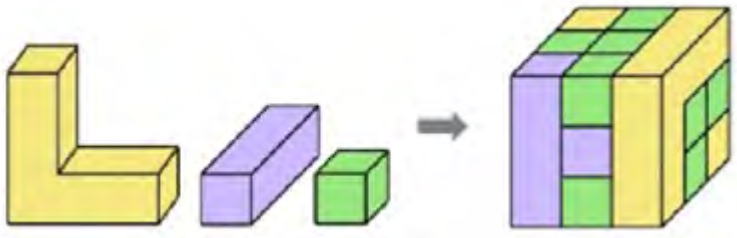
(B) 16

(C) 13

(D)11

(E) 8

Answer:-(D)



SECTION – C (5 POINT PROBLEMS)

3. In left picture is a pyramid made out of cubes. The cubes have a side that's 10 cm long. An ant climbed up and over the pyramid, as is shown by the red line. In right picture is the view of the pyramid from above. How many centimetres did the ant walk across the pyramid?

(A) 30 cm

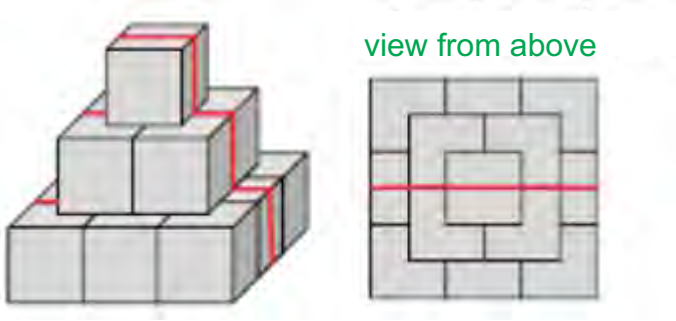
(B) 60 cm

(C) 70 cm

(D) 80 cm

(E) 90 cm

Answer:-(E)

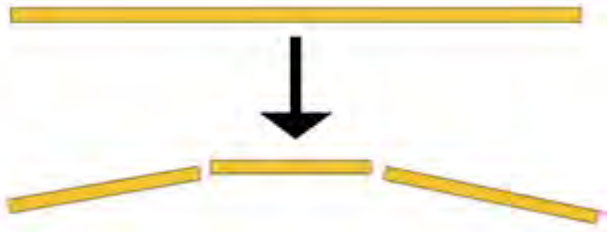


Sample Questions

BENJAMIN- 1 & 2 (GRADE- 5 & 6)

SECTION – A (3 POINT PROBLEMS)

1. Giulia is playing with spaghetti. Every time she breaks one piece of spaghetti, it becomes 3 pieces. She starts with one piece of spaghetti. Which of the following cannot be the number of pieces after she stops?



(A) 13

(B) 17

(C) 20

(D) 23

(E) 25

Answer:-(C)

SECTION – B (4 POINT PROBLEMS)

2. The body mass index BMI of one person is the number got when we divide the person's weight (in kg) by the square of the person's height (in m^2). Supposedly, a BMI of 25.0 or more means overweight, while the healthy range is 18.5 < BMI < 25.0, for adults from 18 to 65 years old. Joanna made her calculation and got BMI = 30.0. She is1.60 m tall. After a painful diet, she got exactly BMI = 25.0. What was her weight's loss?

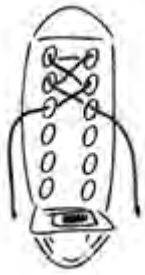
(A) 5.0 kg (B) 6.2 kg (C) 9.8 kg (D) 10.6 kg (E) 12.8 kg

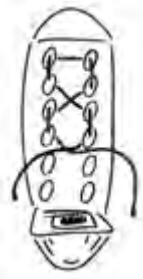
Answer:-(E)

SECTION – C (5 POINT PROBLEMS)

3. There are many ways to arrange a shoelace in a sneaker. If the shoelace always passes once through all the holes and its tips get out through the last two holes, which of the following patterns is not possible?

(A) 

(B) 

(C) 

(D) 

(E) 

Answer:-(E)

Sample Questions

CADET – 1 & 2 (GRADE – 7 & 8)

SECTION – A (3 POINT PROBLEMS)

1. In a bakery cart were 500 of the same croissants. The full cart was three times as heavy as the all of the croissants combined. The full car was also 50 kg heavier than all the croissants. How many grams does one croissant weigh?

   (A) 5 g (B) 25 g (C) 50 g (D) 100 g (E) 200 g

   Answer:-(C)

SECTION – B (4 POINT PROBLEMS)

2. Each shape on the given scales has different mass. What is the total mass of the three shapes?

   (A) 10

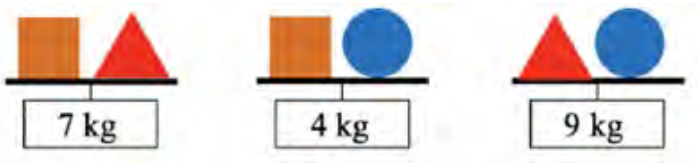
   (B) 11

   (C) 13

   (D) 16

   (E) 20

   Answer:-(A)



SECTION – C (5 POINT PROBLEMS)

3. Max holds his compass upright on the table. How should he choose the angle between the legs, such that the grey area between the two legs and the table surface is the largest possible?

   (A) 45°

   (B) 60°

   (C) 90°

   (D) 120°

   (E) It depends on the length of the legs.

   Answer:-(C)

Sample Questions

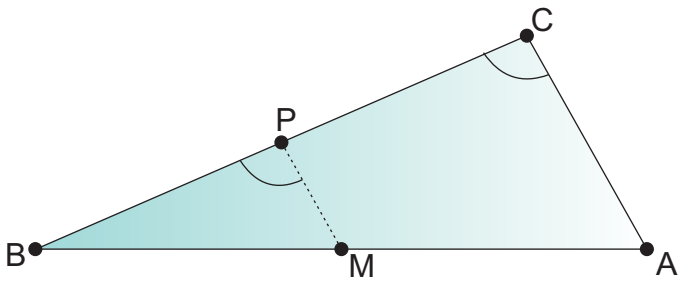
JUNIOR – 1 & 2 (GRADE - 9 & 10)

SECTION – A (3 POINT PROBLEMS)

1. On a triangle ABC with side lengths AC = 4 cm; AB = 12 cm; BC = 10 cm, let M be the midpoint of the side AB and let P be a point on CB such that $\frac{CP}{PB} = \frac{3}{7}$ then the ratio $\frac{\nabla MPB}{\angle ACB}$ is:

(A) 2:3
(B) 1:2
(C) 3:4
(D) 4:7
(E) 5:7

Answer:-(B)



SECTION – B (4 POINT PROBLEMS)

2. Tiny and Biggi are solving puzzles on checkered grids. The time it takes them to solve a puzzle is in direct relation to the number of squares in its grid. Tiny takes t minutes to solve a puzzle on a 25 × 25 grid. Biggi is now solving a puzzle on a 30 × 30 grid. Of course, it will take Biggi longer to finish. Which of the following is the closest to how much longer it will take Biggi than it took Tiny to finish?

(A) $\frac{1}{6} \cdot t$ (B) $\frac{1}{5} \cdot t$ (C) $\frac{1}{4} \cdot t$ (D) $\frac{1}{3} \cdot t$ (E) $\frac{1}{2} \cdot t$

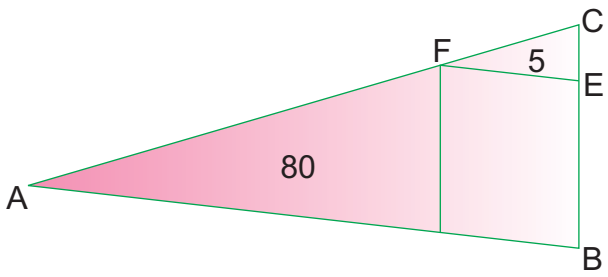
Answer:-(E)

SECTION – C (5 POINT PROBLEMS)

3. In triangle ABC the points D, E and F are on the edges AB, BE and AC, respectively, such that DBEF is a parallellogram. The area of the triangles ECF and ADF are 5 and 80, respectively. What is the area of DBEF?

(A) 16
(B) 40
(C) 75
(D) 80
(E) you can't know

Answer:-(B)



Sample Questions

STUDENT – 1 & 2 (GRADE – 11 & 12)

SECTION – A (3 POINT PROBLEMS)

1. Jorge changes his demeanour from day to day in the following way:

   - If he is happy one day, there is a 70% chance he will be happy the next day, and a 30% chance he will be unhappy the next day.
   - If he is unhappy one day, there is a 50% chance he will be unhappy the next day, and a 50% chance he will be unhappy the next day.

   During his very, very long life, what part of his life will he be happy?

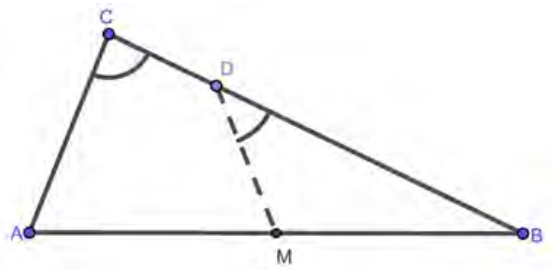
   (A) 3/10 (B) 7/10 (C) 3/8 (D) 5/8

   (E) impossible to know

   Answer:-(D)

SECTION – B (4 POINT PROBLEMS)

2. In a triangle ABC with side lengths AC = 5cm; AB = 10cm; BC = 12cm a point D is drawn on BC in such a way that when joining D to M, the midpoint of AB, the angle MDB equals half the angle ACB. Determine the length in centimetres of the segment DB.



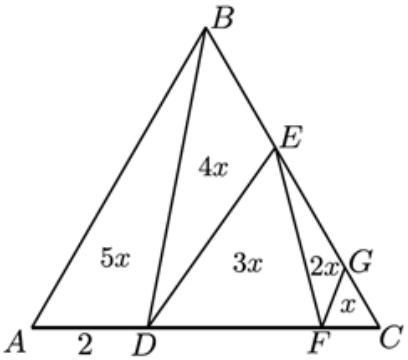
   (A) $\frac{15}{2}$ (B) $\frac{17}{2}$ (C) 9

   (D) $\frac{19}{2}$ (E) 8

   Answer:-(B)

SECTION – C (5 POINT PROBLEMS)

3. Using points on sides of equilateral △ABC, the triangle is divided so that the area of GFC is x, the area of △EFG is 2 x, the area of △EDF is 3 x, the area of △BED is 4 x and the area of △BAB is 5 x (see picture). If |AD| = 2, what is |EG|?



   (A) $3\frac{\sqrt{3}}{2}$ (B) $6\frac{\sqrt{3}}{5}$ (C) $\frac{11}{4}$ (D) $\frac{5}{2}$

   (E) $\frac{12^5}{5}$

   Answer:-(E)

Exam Schedule

- **Contest :** Mathematical Kangaroo Competition
- **Subject:** Math
- **Contest Start Date :** April, 2024
- **Contest End Date :** April, 2024
- **Last Date for Registration :** March, 2024
- **Eligible for Grades :** 1 to 12

- **Note: -** In case of any change in the schedule of the exam, the revised date will be updated on our site.

Exam Fees

- Registration Fee (through Institution/School) per student : **₹500 + GST/-**

Registration Process

Student Registration:

For new individual registration on the IOA website, students must follow the steps mentioned below:
Online student registration: In this case the process of registration would be done by the Parent directly using the link & code shared by the school coordinator with the parents. Offline Student registration The parents /Students would fill in the order form with their details & choices and would submit the form & make the payment to the school coordinator.

School Registration:

Schools interested in participating in the Mathematical Kangaroo Competition can apply through both offline and online modes.

- To register online, visit **https://www.internationalolympiadacademy.com/school-registration.php** and complete the registration form. IOA will get in touch with the school/institution to discuss regarding the registration process for the International Olympiad.
- On completion of the registration process, school will receive a confirmation email with School code and a link, both would then be shared with parents to facilitate student registration.

Preparatory Material

- **Work books**
- **10 Year Question Papers**
- **Online Mock Test Series**
- **Online Coaching Programs**

ORGANISED BY

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