数学花园
探秘
MATHEMATICS GARDEN

2026 Spring Cup
Mathematical Olympiad

Date: 28 February 2026

Time Given: 1 hour 30 minutes

Level: Primary 5

Name: _____

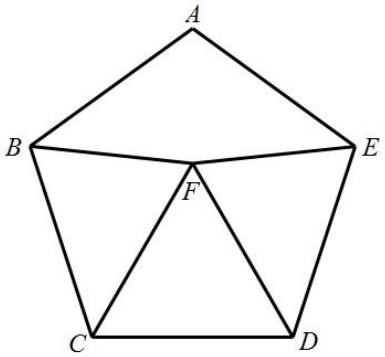
Instructions to Candidates

1. Do not open the booklet until you are told to do so.
2. Answer ALL 20 questions.
3. Write your answers in the answer sheet provided.
4. No steps are needed to justify your answers.
5. Questions 1-7 are worth 4 marks each.
6. Questions 8-14 are worth 6 marks each.
7. Questions 15-19 are worth 8 marks each.
8. Question 20 is worth 10 marks.
9. No marks will be deducted for wrong answers.
10. No marks will be given for unanswered questions.
11. No calculators or mathematical instruments are allowed.

Questions 1 to 7 are worth 4 marks each.

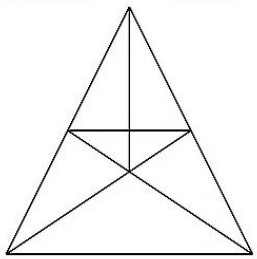
1. Find the value of $76\times(\frac{1}{23}-\frac{1}{53})+23\times(\frac{1}{53}+\frac{1}{76})-53\times(\frac{1}{23}-\frac{1}{76})$.

2. As shown, the pentagon $ABCDE$ is a regular pentagon and the triangle CDF is an equilateral triangle. Find $\angle BFE$ (less than 180 degrees)?



3. In a football round-robin tournament involving four teams—A, B, C, and D—each pair of teams plays exactly 1 match. A win earns 2 points, a loss earns 0 points, and a draw earns 1 point for each team. Teams A, B, and C currently have 5 points, 1 point, and 4 points respectively. Given that Team A ties with Team B, what is Team D's score?

4. Find the number of triangles of the figure.



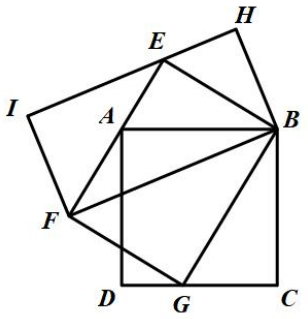
5. In a class of 30 students, the average score for a Science test is 68. Two students, Daniel and Ethan, leave the class. The average score of the remaining students increases to 69. Given that Daniel scores 4 more marks than Ethan, what is Daniel's score?

6. A car travels from point A to point B at 100 km/h, then returns along the same route at 60 km/h. Find the car's average speed for the whole trip.

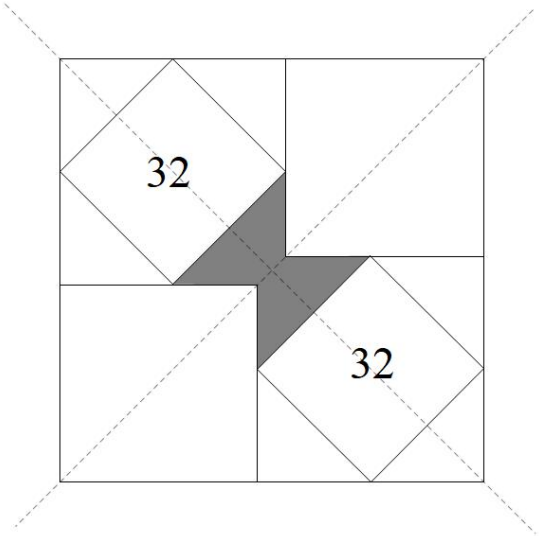
7. There is a 2-digit number x. The remainder when $(x+6)$ is divided by 3 is 1, the remainder when $(x-8)$ is divided by 4 is 1. Find the maximum possible value for x.

Questions 8 to 14 are worth 6 marks each.

8. As shown in the figure, the square *ABCD* has a side length of 8 cm, and the rectangle *BFIH* has a length of 10 cm. What is the width of the rectangle?



9. As shown in the figure, in a square with an area of 225, place four small squares to form a symmetrical figure with two lines of symmetry. Two squares with an area of 32 are marked and the other 2 square are also the same. Find the area of the shaded region.



10. Use the 2026 numbers 2, 3, 4,..., 2026,2027 as numerators and denominators to construct 1013 fractions. The minimum value of the largest fraction among these 1013 fractions is $\frac{b}{a}$. Find the value of $a+b$.

11. From City P to City Q, it takes Car A 3 hours and Car B 7 hours. Two cars travel towards each other from two cities and meet at a point 21 km away from the midpoint of PQ. What is the distance between City P and City Q in km?

12. Alex write a sequence with 2 pattern as below, he can write any one pattern randomly, but he must finish writing before modifying the next pattern.

(i) AAABAAC

(ii) AABBACC

After he finished a whole number of patterns, he found there are 125 "A"s and 46 "B"s. Find the number of complete pattern of (i).

13. Given that $N = 2^a \times 3^b$, the number of its factors is 12, and the sum of all factors is 1092. Find the sum of a and b.

14. As shown in the figure below, A~G represent the digit 1~7, the same letter represent the same digit, different letter represent different digits. Find the 4-digit number "$\overline{ABCD}$".

$$\begin{array}{cccc} & & A & B \\ & \times & C & D \\ \hline & F & C & D \\ E & A & E & \\ \hline E & G & A & D \end{array}$$

Questions 15 to 19 are worth 8 marks each.

15. Write the squares of 1~100 together to form a number 1491625⋯980110000 . Find the remainder when 1491625⋯980110000 is divided by 9.

16. A student is conducting a controlled experiment to investigate the relationship between auxin concentration and plant growth. He plans to prepare 2026 grams of 10%,20%,30%,40%, and 50% auxin solutions using 60% auxin and distilled water. Find the total amount of distilled water required for preparation(in gram).

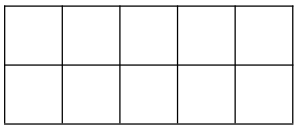
17. There are 12 lamps, each with one of three colors: red, yellow, or green. Allen, Benjamin, Cindy, and Daniel don't know the actual lighting status. The table below summarizes their color guesses for each lamp and the number of correct guesses:

number	1	2	3	4	5	6	7	8	9	10	11	12	correct guesses
Allen	Y	R	Y	G	R	R	G	Y	G	G	Y	R	6
Benjamin	Y	G	G	R	G	Y	Y	G	R	Y	R	Y	7
Cindy	R	G	Y	R	G	G	Y	Y	R	R	Y	Y	9
Daniel	G	Y	R	R	Y	R	R	G	R	Y	G	G	

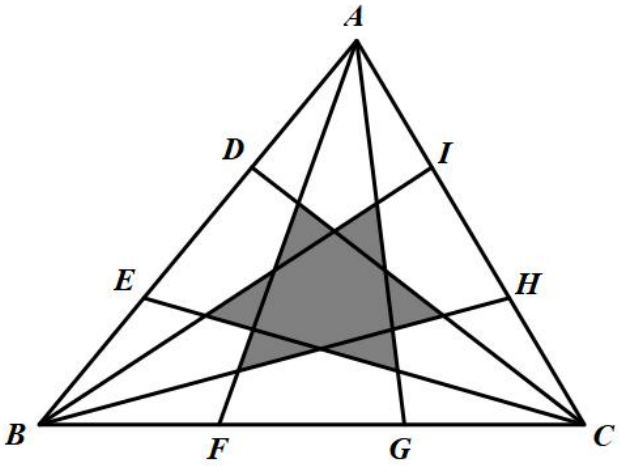
Y - Yellow, R - Red, G - Green

Find the number of correct guesses of Daniel.

18. How many ways are there to colour the 2×5 grid below using 4 different colours such that each cell is coloured with only one colour and the colour of adjacent cells must be different.



19. As shown in the figure, triangle ABC has an area of 140. $AD = DE = EB$, $BF = FG = GC$, $CH = HI = IA$, find the area of the shaded part.



Question 20 is worth 10 marks.

20. In your opinion, from question 1 to 19, your favourite question is question _____ and the most difficult question is question _____.
(As long as your answer is within 1 to 19, you get full marks, otherwise you get zero.)