





# Primary Application Questions (for entry in 2024)

#### Student name (please type or print using BLOCK LETTERS)

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The Mathematical Association of Western Austra 12 Cobbler Place MIRRABOOKA WA 6061							ralia		<u>psp@mawa.edu.au</u> Scan and attach as a single PDF document Include student name as your email subje					nt. jec							
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Applications must be received by Monday 30 October 2023. Late applications will <u>NOT</u> be accepted.

# **Instructions for applicants**

Complete as many of the following questions as you can. Remember:

- These questions are designed to be challenging
- You are not expected to know how to solve all of them
- Explain your reasoning and show your working where possible
- You can use the spare pages if you require additional space.

#### **Student declaration**

I understand admission to the MAWA Problem Solving Program is **by invitation** based on the work I have submitted. I declare that these solutions are entirely my own work.\*

Student signature: \_\_\_\_\_

\*MAWA reserves the right to remove students from the MAWA Problem Solving Program in the event of a false or misleading declaration.

Problem 1

403 is a 3-digit number, while 034 and 007 are not. The digits of 403 are 4, 0 and 3. The sum of these digits is 4 + 0 + 3 = 7. Write down all of the 3-digit numbers for which the sum of the digits is 6. How many of these numbers are there?

In this number puzzle, you must use the following clues to work out the value of each of the letters.

Each of the letters A, B, C, D and E stands for one of the numbers 1, 2, 3, 4 and 5.

Each letter represents a different number.

The grid has been provided to help you solve the puzzle. Place a tick in the correct box for each of the letters.

> 1. C + E = B2. A + C = 53. A < B



In my pocket I have five coins:

- a 5c coin
- a 10c coin
- a 20c coin
- a 50c coin, and
- a \$1 coin.

How many different amounts of money can I make up using <u>one or more</u> coins?



A palindrome is a number whose digits are the same when read forwards or backwards.



For example, 474 and 222 are palindromes.

How many palindromes are there between 100 and 1000?

This figure consists of 8 identical parallelograms, joined as shown:

Including these 8 small parallelograms, what is the total number of parallelograms which appear in this figure?







Murray is attempting to place as many counters as possible on this 4 x 4 grid, without placing more than 3 counters in any row, column or diagonal.



What is the maximum number of counters he can place on the grid?

Show two ways in which this can be done.

## Spare page