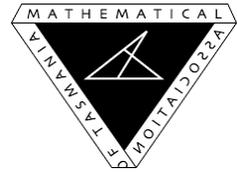# M.A.T. RELAY COMPETITION
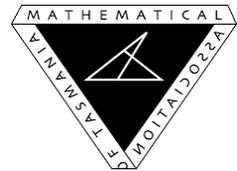## JUNIOR SECONDARY [Year 7 - 8] SAMPLE

**1.** Guess my number:
I am a positive integer less than 100
The sum of my digits is an even number
I have 8 factors
I am between two prime numbers

**ANSWER**

**5 MARKS**

---

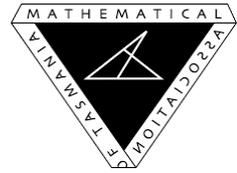# M.A.T. RELAY COMPETITION
## JUNIOR SECONDARY [Year 7 - 8] SAMPLE

**2.** Michael was asked by his teacher to subtract 3 from a certain number and then divide the result by 9. Instead he subtracted 9 and then divided the result by 3, giving an answer of 43. What would his answer have been if he had worked out the problem correctly?
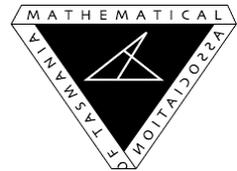
**ANSWER**

**5 MARKS**

**3.**

Gary, a cabinet maker, uses a power saw to cut a piece of timber into 6 pieces in 2 ½ minutes. How long would it take to cut a similar piece of timber into 9 pieces?
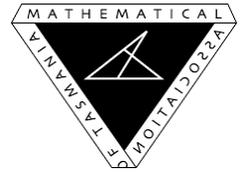
ANSWER

**5 MARKS**

---

**4.** Travelling by car from town A to town B, I passed a sign saying 'Town B 150 km'. After travelling a further 7 km, I passed another sign saying 'Town A 250 km'.
How many kilometres is it by car from town A to town B?

ANSWER

**5 MARKS**

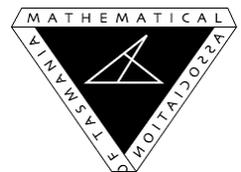**5.** Suppose that a, b, and c are positive integers such that
ab = 18,
bc = 24, and
ac = 48.

What is the value of a + b + c?

ANSWER

10
MARKS

---

**6.**     If     $a \otimes b =$

$$\frac{a + b}{a - b}$$

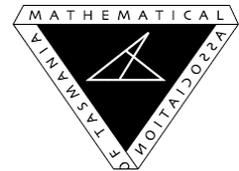What is the value of $(6 \otimes 4) \otimes 3$?

ANSWER

10
MARKS
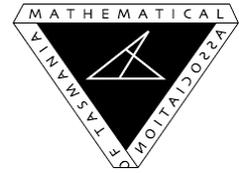
**7.** The positive integers are written consecutively using the patterns shown below.  What integer will be the eighth entry in row A?

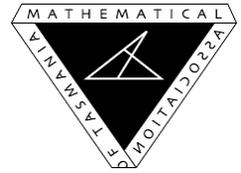| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Row A** | | | 4 | | | 10 | | |
| **Row B** | | 3 | 5 | | 9 | 11 | | |
| **Row C** | 2 | | 6 | 8 | | 12 | 14 | |
| **Row D** | 1 | | | 7 | | | 13 | |

**ANSWER**

**10 MARKS**

---

**8.** You have a fish tank containing 200 fish and 99% of them are guppies.  You will remove guppies until 98% of the remaining fish are guppies.
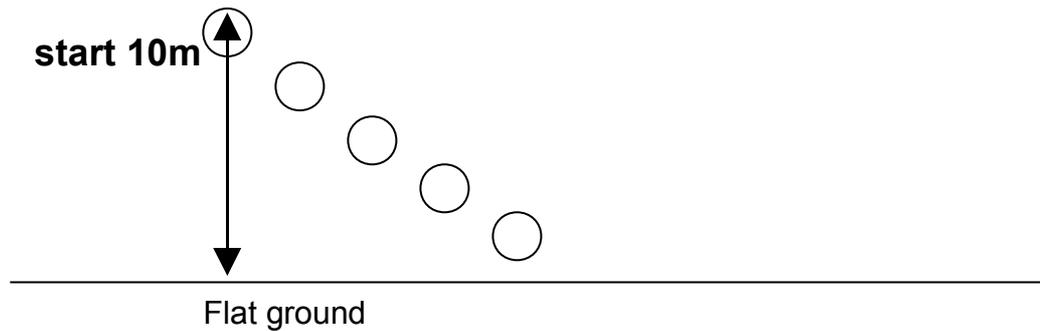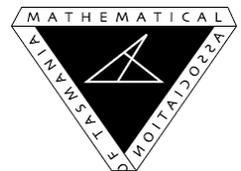How many will you remove?

**ANSWER**

**15 MARKS**

**9.** **A ball is dropped from a height of 10 metres and bounces back up to a height of 7metres. I few assume that the recovered height after bouncing continues at the same rate, how high will the ball bounce on the fourth bounce? Give your answer to the nearest centimetre.**

**start 10m**

Flat ground

**ANSWER**

**15 MARKS**

**10.**

$300 is divided in the ratio 2 : 3. The larger part is then divided into two parts in the ratio 3 : 2.

How big is the smallest of the three resulting parts?

**ANSWER**

**20 MARKS**