



Team
Maths
Challenge
2013

Regional
Final

Mini Relay
Round

A1

D is the value of $2^2 + 2^0 + 2^1 + 2^3$.

Pass on the value of the odd number D .



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Maths
Challenge
2013

Regional
Final

Mini Relay
Round

A3

T is the number that you will receive.

Inside a cuboid box of dimensions $T \text{ m} \times 2 \text{ m} \times 2 \text{ m}$
I can fit a maximum of C cubes of side $\frac{2}{3} \text{ m}$.

Pass on the value of C .



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Maths
Challenge
2013

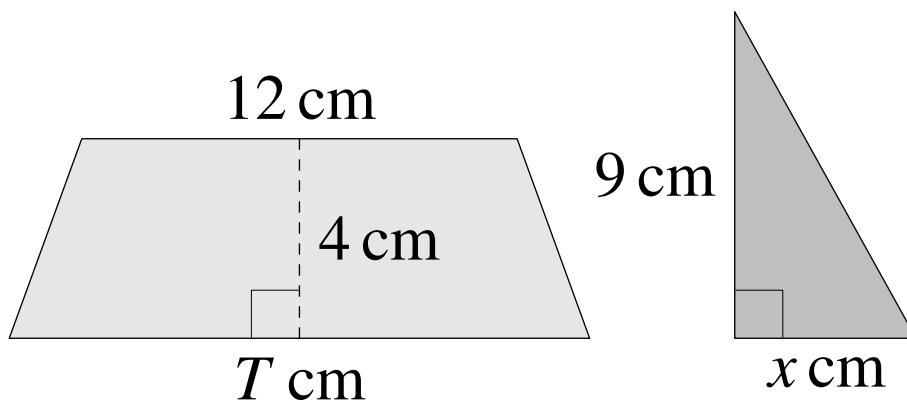
Regional
Final

Mini Relay
Round

A2

T is the number that you will receive.

The area of the trapezium shown below is three times the area of the triangle.



Pass on the value of the whole number x .



Team
Maths
Challenge
2013

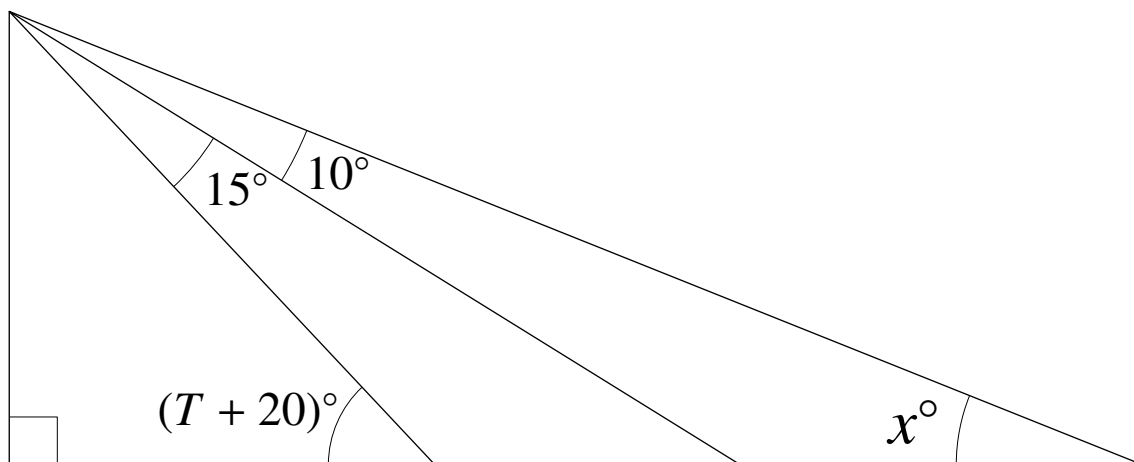
Regional
Final

Mini Relay
Round

A4

T is the number that you will receive.

The angle x° is marked in the diagram below.



Write down the value of x .



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Maths
Challenge
2013

Regional
Final

Mini Relay
Round

B1

U, K, M and T are different single digit numbers such that

$$U + K + M = T \quad \text{and} \quad U \times T = K \times M.$$

Pass on the value of T .



Team
Maths
Challenge
2013

Regional
Final

Mini Relay
Round

B3

T is the number that you will receive.

$\pounds (8T)$ is divided in the ratio $2 : 5 : 13$.

The middle share is $\pounds P$.

Pass on the value of P .



Team
Maths
Challenge
2013

Regional
Final

Mini Relay
Round

B2

T is the number that you will receive.

$$x = 10(T + 3) - 8(T + 4)$$

Pass on the value of x .



Team
Maths
Challenge
2013

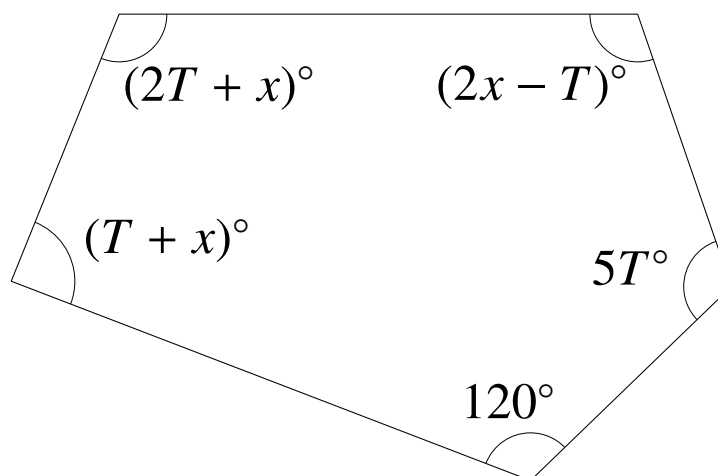
Regional
Final

Mini Relay
Round

B4

T is the number that you will receive.

The irregular pentagon below has angles as marked.



Write down the value of x .

Note: the angles in a pentagon sum to 540° .



C1

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Maths
Challenge
2013

Regional
Final

Mini Relay
Round

Tania was given M mints yesterday morning, and immediately she ate $\frac{1}{3}$ of them.

Earlier today she ate $\frac{1}{3}$ of her remaining mints.

This leaves Tania 4 mints to enjoy tomorrow.

Pass on the value of M .



C3

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Maths
Challenge
2013

Regional
Final

Mini Relay
Round

T is the number that you will receive.

Natasha is playing a game where she starts facing North. She then turns alternately clockwise and anticlockwise, increasing the angle through which she turns by 10° each time.

Thus, her first 4 turns are: 10° clockwise, 20° anticlockwise, 30° clockwise, 40° anticlockwise.

When Natasha has completed T such turns, the smallest angle through which she must turn to face North again is D° .

Pass on the value of D .



Team
Maths
Challenge
2013

Regional
Final

Mini Relay
Round

T is the number that you will receive.

C2

Pass on the mean of the numbers:

$$T + 2, T + 4, T + 8, T + 16, T + 32, T + 64$$



Team
Maths
Challenge
2013

Regional
Final

Mini Relay
Round

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C4

The lowest common multiple of 105 and T is 1050.

Write down the highest common factor of 105 and T .



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Maths
Challenge
2013

Regional
Final

Mini Relay
Round

D1

In this question $(n)^*$ means
"the sum of the squares of the digits of n ".

For example: $(85)^* = 8^2 + 5^2 = 89$.

Let $Q = ((2013)^*)^* + 1$.

Pass on the value of Q .



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Maths
Challenge
2013

Regional
Final

Mini Relay
Round

D3

T is the number that you will receive.

A cube of side 18 units has a surface area which is numerically equal to the volume of a cuboid with sides 9, T and x units.

Pass on the value of x . (Fully simplify your answer.)



Team
Maths
Challenge
2013

Regional
Final

Mini Relay
Round

T is the number that you will receive.

D2

In the Martian Olympics, Team Deimos achieved T silver medals. They achieved three times as many gold medals as silver medals and four times as many bronze medals as silver medals.

M is the total number of medals that Team Deimos won.

Pass on the value of M .



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Maths
Challenge
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Regional
Final

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T is the number that you will receive.

D4

Dominique is driving her new car. It will travel 13 km per litre of petrol. Petrol costs £1.30 per litre, and Dominique travels $8T$ km.

Write down how many pence her journey will cost her.