



A1

Team
Maths
Challenge
2012

Pass on the value of:

Regional
Final

$$\sqrt{2^2 + 0^2 + 1^2 + 2^2}.$$

Head-to-
Head
Round



A3

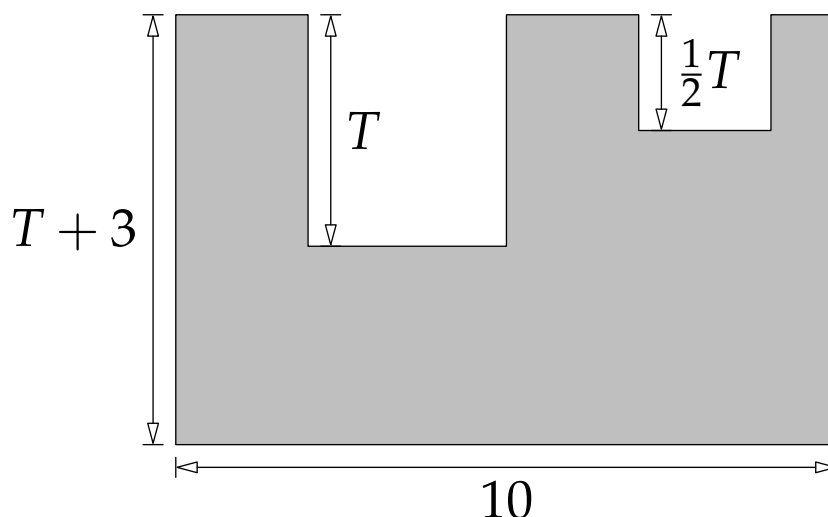
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T is the number that you will receive.

Regional
Final

Little Tommy has drawn a castle made out of rectangular shapes. Some of the measurements are shown below.

Head-to-
Head
Round



Pass on the length of the perimeter of this shape.



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Head-to-
Head
Round

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A2

Pass on the value of:

$$\left(\frac{0.1 + 0.2 \times 0.4}{0.3} \right) \times T.$$



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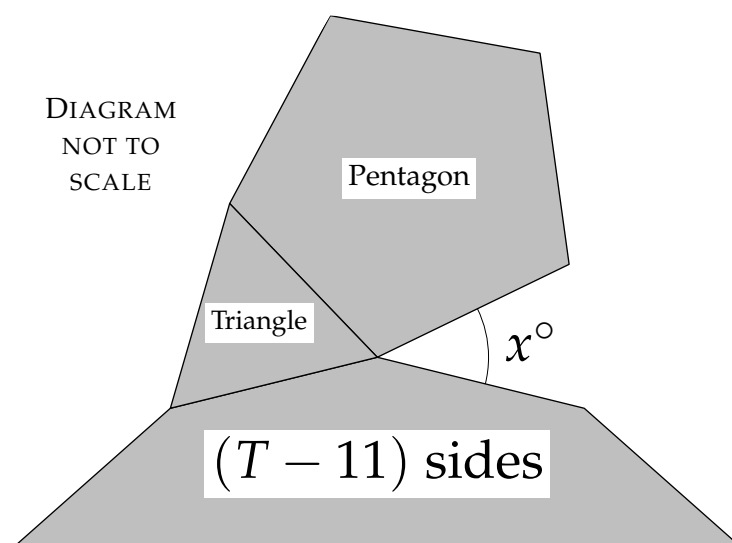
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Head-to-
Head
Round

T is the number that you will receive.

A4

Three regular polygons meet at a point, as shown:



Write down the value of x .



B1

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Claire's Classic Corvette car increased in value by 20% during the first year after she bought it.

Regional
Final

The next year, after a minor collision, it lost $\frac{3}{8}$ of its new value.

Head-to-
Head
Round

Claire calculated that her crashed Corvette car is currently worth $C\%$ less than when she bought it.

Pass on the value of C .



B3

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T is the number that you will receive.

The highest common factor of $7T$ and 70 is H .

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Pass on the value of H .

Head-to-
Head
Round



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Head-to-
Head
Round

B2

T is the number that you will receive.

A triangle has angles:

$$(n + 10)^\circ, \quad (n + 20)^\circ \quad \text{and} \quad (n + 3T)^\circ.$$

Pass on the value of n .



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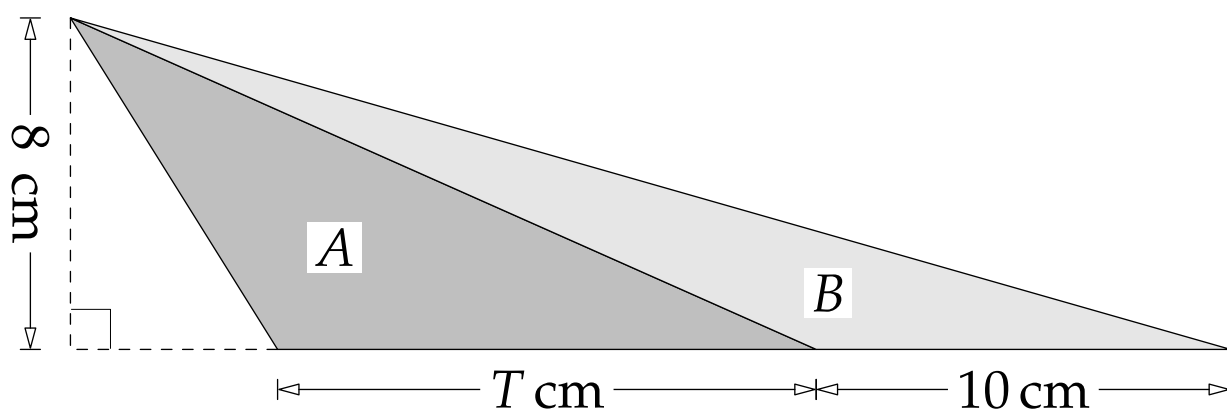
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Head-to-
Head
Round

B4

T is the number that you will receive.

The diagram shows two triangles, A and B , with lengths as marked.



Write down the ratio of the area of triangle A to the area of triangle B , in its simplest terms.



C1

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Head-to-
Head
Round

Let P = the sum of the first 6 odd numbers.

Let Q = the sum of the first 5 even numbers.

Pass on, as a fraction in its lowest terms,
the value of $\frac{P}{Q}$.



C3

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Head-to-
Head
Round

T is the number that you will receive.

When written as a decimal, the fraction $\frac{4}{13}$ recurs every 6 digits. Let D be the sum of these six digits.

Pass on the value of $\frac{D}{T}$.



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C2

T is the number that you will receive.

T is the mean of the numbers

0.1, 0.3, 1, 1.6 and n

Pass on the value of n .



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C4

T is the number that you will receive.

Mary, Mungo and Midge are eating grapes.

Midge eats 4 grapes. Mary eats $(2T + 2)$ more than Midge, and Mungo eats T times as many as Midge.

The ratio of the number of grapes eaten by Mary to the number of grapes eaten by Mungo in its lowest terms is $X : Y$.

Write down the value of $X + Y$.



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Head-to-
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D1

You are told that

$$\frac{1}{3} + \frac{2}{5} + \frac{3}{7} = \frac{a}{105}.$$

Pass on the sum of the digits of a .



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D3

T is the number that you will receive.

The whole number

$$\frac{T}{120}$$

when written as a product of powers of its prime factors, is

$$2^a \times 3^b \times 5^c.$$

Pass on the value of $ac + b$.



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T is the number that you will receive.

D2

The *Terrifik Toys* company makes magic cubes of side T cm.

Exactly C of these cubes will fit inside a huge shipping crate of size T m \times T m \times $(T + 4)$ m.

Pass on the value of C .



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T is the number that you will receive.

D4

Bill and Ben are running a race along a track $100T$ metres long. They start together.

Bill runs at an average speed of 4 metres per second and Ben runs at an average speed of 200 metres per minute.

Write down the number of seconds which elapse between Bill and Ben crossing the finish line.