

A1 Write down the value of n that makes this equation correct:

$$27 \times 120 \times n = 96 \times 75 \times 36.$$



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A3 *T is the number that you will receive.*

The mean of a list of T numbers is 15.

One more number is added to the list and the mean is recalculated as 14.

Write down the value of the extra number.



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A2 *T is the number that you will receive.*

The exterior angles of a hexagon have a sum of 360 degrees. Three of the exterior angles are equal to $\frac{1}{2}T^\circ$, T° and $2T^\circ$. The three remaining exterior angles are in the ratio 1 : 4 : 5.

Write down the size, in degrees, of the smallest exterior angle.



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A4 *T is the number that you will receive.*

Write down the value of

$$\left(\frac{(2T + 1)^2 - 1}{2} - 2T \right)^2.$$



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B1 Write down the value of this expression
(your answer should be a positive whole
number):

$$\sqrt{\left(\left(\left(\left(\left(\frac{3}{4}\right)^2 \div \frac{2}{5}\right) \times \frac{8}{9}\right) \div \frac{5}{16}\right)\right)}$$



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B3 *T is the number that you will receive.*

A set of T squares, each with area 1 cm^2 are packed together into a rectangle with area $T \text{ cm}^2$. Rectangles of six different shapes can be created in this way.

Write down the difference, in centimetres, between the smallest and largest perimeters of these rectangles.



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B2 *T is the number that you will receive.*

A solid steel cuboid measuring 3 metres by 8 metres by T metres is melted down and recast into smaller cuboids measuring 30 cm by 50 cm by 160 cm.

How many smaller cuboids is it possible to make?



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B4 *T is the number that you will receive.*

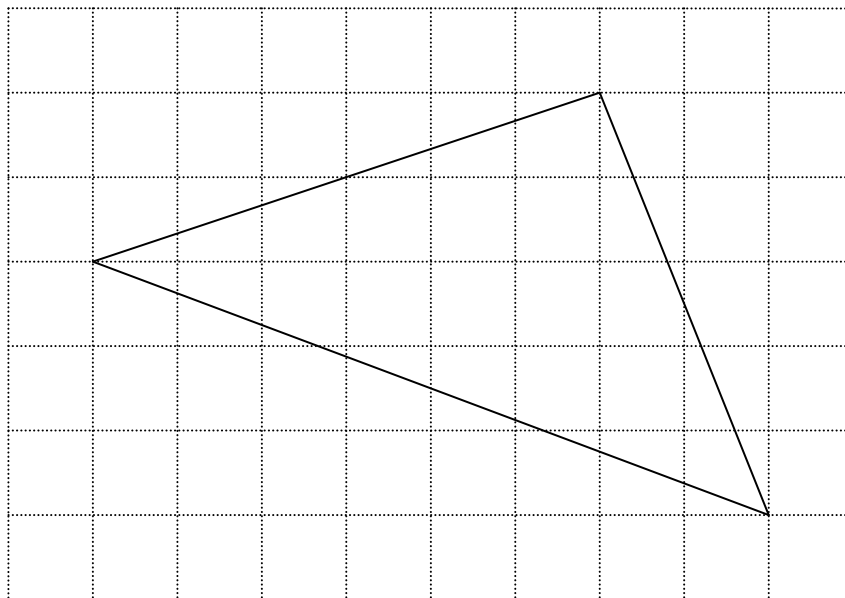
Write down the lowest common multiple of *T* and 156.



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C1 The grid below shows squares of area 1.



T is the area of the triangle shown.
Write down the value of T .

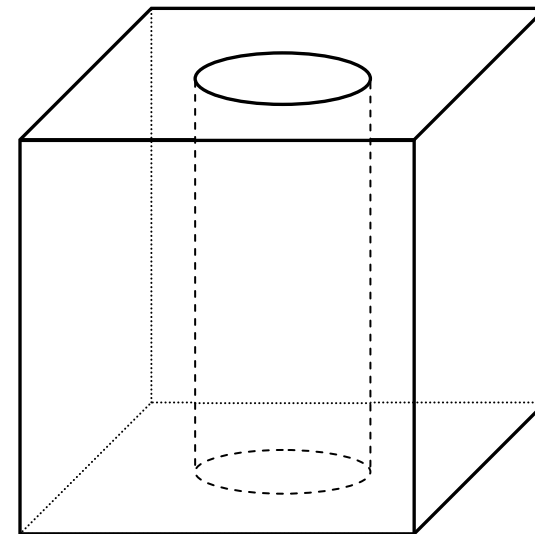


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C3 *T* is the number that you will receive.

A mathematician drills a cylindrical hole of radius 1cm straight through the middle of a cube of side $\frac{T}{2}$ cm.



The resulting shape has total surface area $(a + b\pi)$ cm², where a and b are whole numbers.

Write down the value of $a - b$.



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C2 *T is the number that you will receive.*

The calculation:

$$\left(1 - \frac{1}{2}\right) \times \left(1 + \frac{1}{3}\right) \times \left(1 - \frac{1}{4}\right) \times \left(1 + \frac{1}{5}\right) \times \left(1 - \frac{1}{6}\right) \times \left(1 + \frac{1}{7}\right) \times \dots \times \left(1 - \frac{1}{T-1}\right) \times \left(1 + \frac{1}{T}\right)$$

gives a fraction $\frac{a}{b}$, which is in its lowest

terms. Write down the value of $b - a$.



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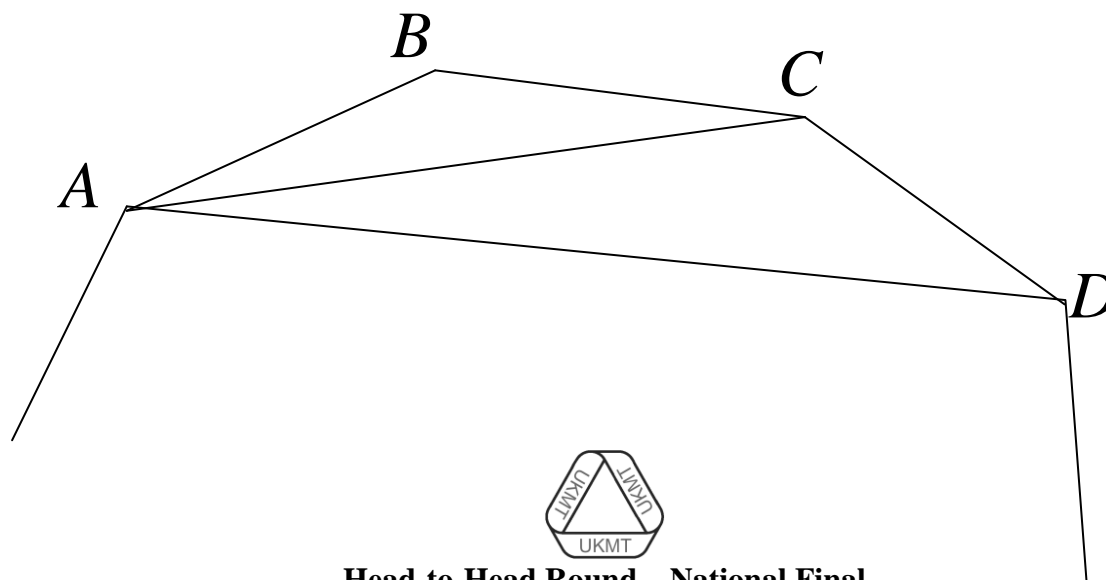


C4 *T is the number that you will receive.*

The exterior angles of any regular polygon have a sum of 360 degrees.

The points *A*, *B*, *C*, and *D* are consecutive vertices on a regular *T*-sided polygon.

How many degrees is angle *ACD*?



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D1 Twins Anna and Bob each have toy building blocks with the letters of their names on them.

Bob can make three different “words” from his:

B	O	B
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B	B	O
---	---	---

O	B	B
---	---	---

How many different “words” could Anna make from hers?

A	N	N	A
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D3 *T is the number that you will receive.*

John cycles at T km per hour for 15 minutes, rests for 3 minutes, and then cycles at $(T + 1)$ km per hour for 12 minutes.

What is the average speed for the whole journey in km per hour?



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D2 *T is the number that you will receive.*

a = T, b = 2T, and c = -3T, write down the value of $\sqrt{b^2 - 4ac}$.



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D4 *T* is the number that you will receive.

At current exchange rates, 20 Bibbles equal 24 Babbles, and 18 Babbles equal 32 Bobbles.

How many Bobbles equal $(2T + 1)$ Bibbles?



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