

A1

The four members of the *Mean Girls* pop group have mean height 149 cm.

Nicky joins the group, and is N cm taller than the previous mean. This increases the mean height of the *Mean Girls* to 152 cm.

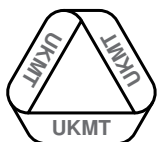
Pass on the value of $N - 1$.

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A3

T is the number you will receive.

R is the remainder when $(T^2 + 17^2)$ is divided by 7.

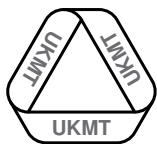
Pass on the value of R .

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T is the number you will receive.

A2

This year, 2014, contains 365 days.

365 can be written as the sum of two squares in the form

$$365 = A^2 + T^2.$$

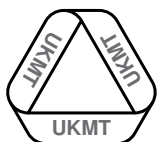
Pass on the positive value of A .

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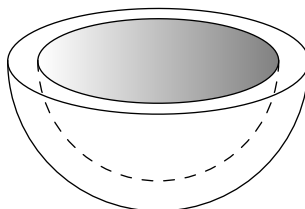
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T is the number you will receive.

A4

Timmy has made a wooden bowl, starting with a hemisphere of wood of radius 10 cm and cutting a hemisphere of radius 8 cm out from the centre of it.



He wishes to varnish the whole of it, and he finds that he needs T ml of varnish per 4π cm² of surface area.

Write down the number of ml of varnish Timmy needs.

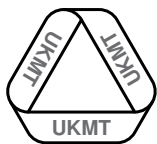
[The surface area of a sphere of radius r is $4\pi r^2$.]

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B1

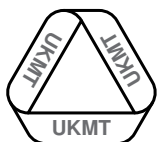
The value of

$$\frac{1}{2} \div \frac{3}{4} \times \left(\frac{5}{6} + \frac{7}{8} \right) \times \frac{9}{10}$$

can be written as an improper fraction $\frac{a}{b}$, which is in its lowest terms.

Pass on the value of $a - b$.

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B3

T is the number you will receive.

The difference between the squares of two consecutive numbers is $T + 1$.

Pass on the value of the smaller of these two numbers.

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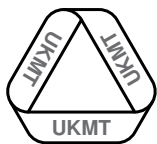
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B2

The angles in an irregular quadrilateral form a sequence in which each term is $8T^\circ$ larger than the previous one. The smallest angle is A° .

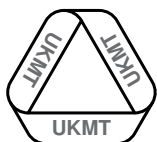
Pass on the value of A .

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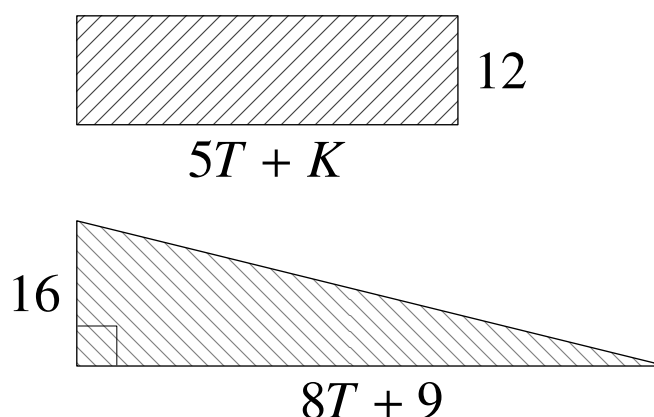
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T is the number you will receive.

B4

The rectangle and the right-angled triangle in the diagram have the same area.



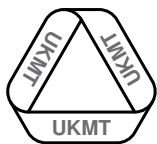
Write down the value of K .

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C1

Every week, Jo buys apples, bananas, pears and oranges to feed her pet monkeys. Last week she bought J pieces of fruit, where $J < 150$.

She noticed that the ratio of apples to bananas was 3:2, the ratio of bananas to pears was 5:4 and the ratio of pears to oranges was 3:1.

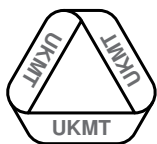
Pass on the value of J .

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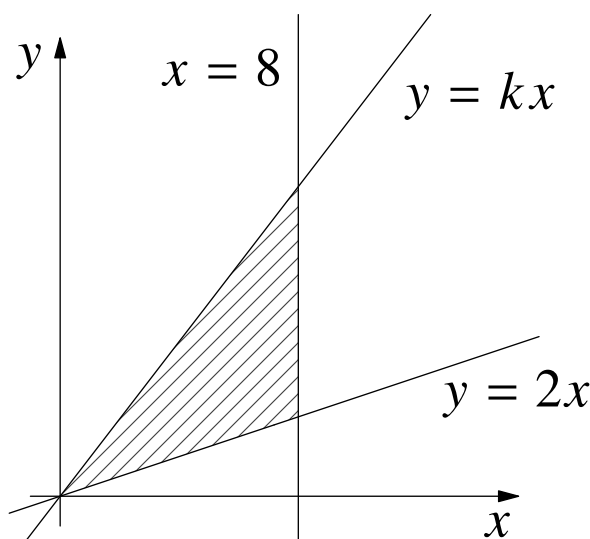
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C3

T is the number you will receive.

In the graph below, the area of the shaded triangle is $T + 5$.



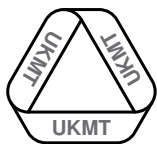
Pass on the value of k .

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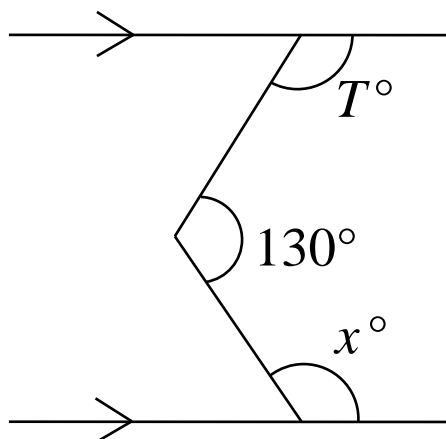
T is the number you will receive.

C2

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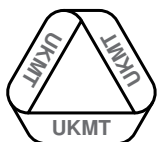
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Pass on the value of x .

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C4

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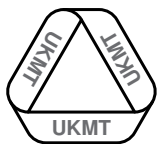
When Niall's class were surveyed to find out how many pet dogs each person had at home, the results were:

Number of dogs	Frequency
0	$T + 2$
1	9
2	2
3	1

Let $K = \text{mean} + \text{mode} + \text{range}$.

Write down the value of $10K$.

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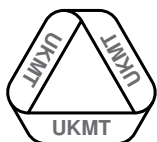
D1

In a class survey of 20 people about crisp flavours:

12 like Cheese & Onion
15 like Salt & Vinegar
2 like neither flavour

Pass on the number of people who like both flavours.

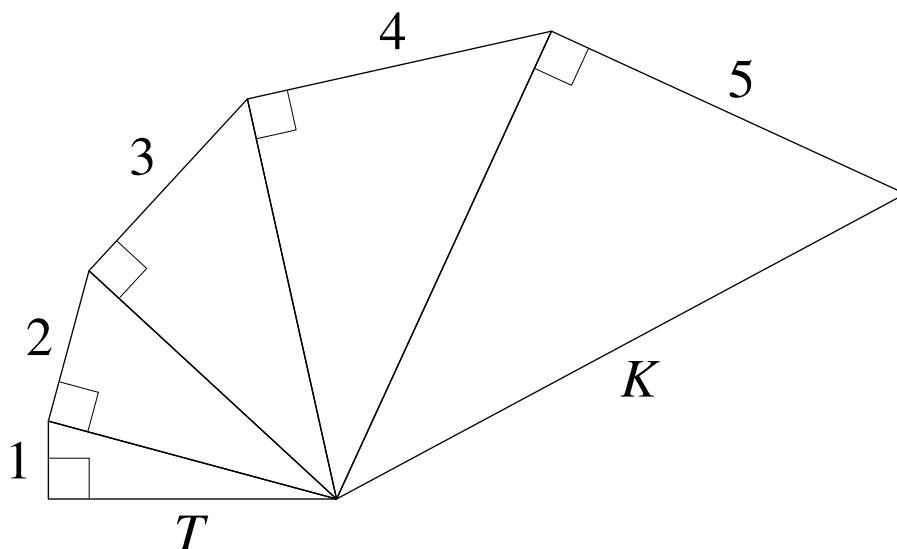
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D3

T is the number you will receive.

The diagram shows five right-angled triangles, with lengths as shown.



Pass on the value of K .

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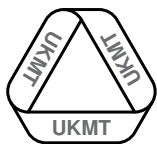
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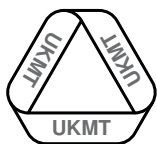


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D2

T is the number you will receive.

In this question, the diamond symbol \diamond means "the difference between the squares of the numbers on either side".

For example, $6 \diamond 8 = 8^2 - 6^2 = 28$.

You are told that D is a positive integer and $(2 \diamond 3) \diamond D = T$.

Pass on the value of $D - 1$.

D4

T is the number you will receive.

A fair die marked

1, 2, 3, 4, 5, 6

and a fair die marked

2, 4, 7, $(T - 1)$, $(T + 1)$, 15

are rolled together.

Write down, as a fraction, the probability that the sum of the scores is a prime number.

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<p>A1</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>B1</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>C1</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>D1</p> <p style="text-align: right;">(0) (1) (3)</p>
<p>A2</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>B2</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>C2</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>D2</p> <p style="text-align: right;">(0) (1) (3)</p>
<p>A3</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>B3</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>C3</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>D3</p> <p style="text-align: right;">(0) (1) (3)</p>
<p>A4</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>B4</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>C4</p> <p style="text-align: right;">(0) (1) (3)</p>	<p>D4</p> <p style="text-align: right;">(0) (1) (3)</p>

BONUS (3)

BONUS (3)

BONUS (3)

BONUS (3)

A TOTAL /15

B TOTAL /15

C TOTAL /15

D TOTAL /15

Circle the mark awarded for each question and cross out the others.
 At the end of the round, either circle the bonus mark or cross it out.

FINAL SCORE /60