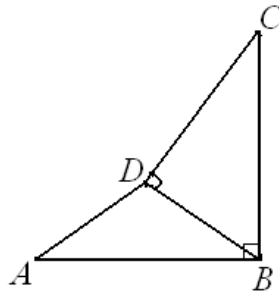


Maths Quiz (Run one a day with the Answers on Friday)

Monday 1 August

In the diagram below, $AB \perp BC$, $AB = BC$, $\angle BDC = 90^\circ$, $BD = 3\text{cm}$ and $CD = 5\text{cm}$. Find the area of triangle $\triangle ABD$, in cm^2 .



Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

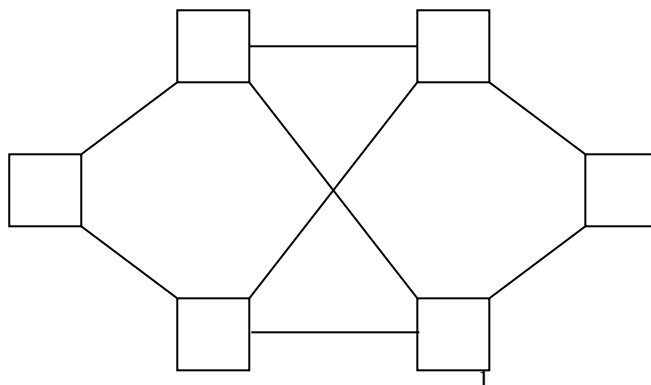
Tuesday 2 August

Five boys went fishing and caught 31 fish. The boy who caught the most number of fish has 3 times as many fish as the boy who caught the least number of fish. How many fish has the boy who caught the second largest number of fish if all of them caught a different number of fish? Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

Wednesday 3 August

In the diagram below, six boxes are joined by eight line segments. The numbers 1, 2, 3, 4, 5 and 6 are to be placed into the boxes without repetition and each box can only contain one number. At most how many line segments are there connecting two boxes with non-consecutive numbers? Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

3.



Thursday 4 August

Find the value of

$$100 \times 99 - 99 \times 98 + 98 \times 97 - 97 \times 96 + \dots + 4 \times 3 - 3 \times 2 + 2 \times 1.$$

Answer this question and hand full working to Mr Hodsdon in the maths staff room.

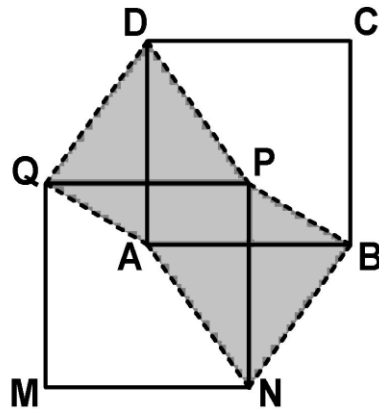
The best solution will win a chocolate egg.

Friday 5 August

Answers : Monday – 4.5 , Tuesday – 8 , Wednesday – 8 , Thursday -5000

Monday 8 August

In the diagram below, squares $ABCD$ and $MNPQ$ have segments AB and PQ which are parallel and equal. Find the ratio of the area of the shaded part to the area of square $ABCD$. Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.



Tuesday 9 August

Three numbers 70, 98 and 143 are divided by a positive integer. If the sum of the three remainders is 29, find this positive integer. Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

Wednesday 10 August

The sum of 888 consecutive positive integers

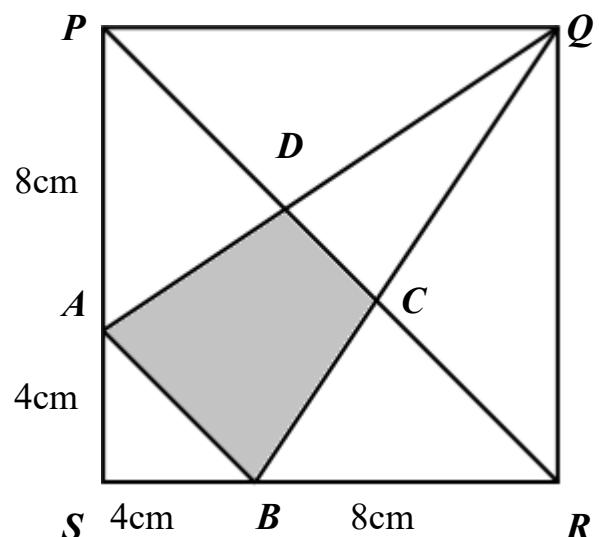
$$n + (n+1) + (n+2) + (n+3) + \dots + (n+886) + (n+887)$$

is a perfect square. Find the smallest possible value of n . Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

Thursday 11 August

In the diagram below, square $PQRS$ has sides of 12 cm. If $AS = BS = 4$ cm,

$PA = BR = 8$ cm, find the area of trapezoid $ABCD$, in cm^2 . Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

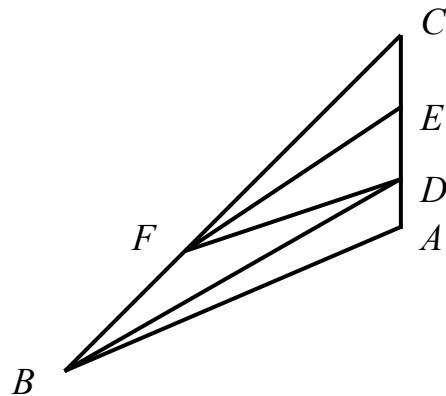


Friday 12 August

Answers : Monday – 1:1 ,Tuesday – 47 ,Wednesday –56,Thursday - 25.6

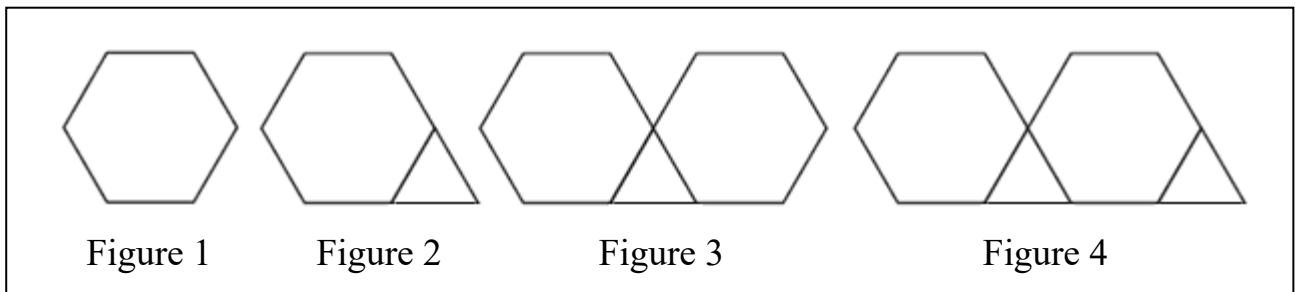
Monday 15 August

$\triangle ABC$ is divided by segments BD , DF and FE into four small triangles as shown in the diagram below. Those four small triangles have equal areas. If $BF = 2DE$, find the ratio of $AC : BC$. Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.



Tuesday 16 August

The regular hexagons and the equilateral triangles, with each side 1 cm, are placed together as a polygon as shown in Figures 1, 2, 3, 4, ... Find the outer perimeter of the polygon in Figure 2011, in cm. Answer this question and hand full



working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

Wednesday 17 August

What is the last digit of the sum of 7777^7 and 77^{77} ? Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

Thursday 18 August

There are three boxes of marbles. Each box contains a different number of marbles.

From the first box, I remove $\frac{1}{3}$ of the number of marbles, from the second box, I remove $\frac{1}{4}$ of the number of marbles and from the third box, I remove $\frac{1}{5}$ of the number of marbles. Finally, there is an equal number of marbles remaining in all the three boxes. What is the smallest possible number of marbles which I may have

removed in total? Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

Friday 19 August

Answers : Monday – 4:9 , Tuesday – 5031 , Wednesday – 0 , Thursday - 13

Monday 22 August

Mr Hodsdon is preparing to take part in a competition. While relaxing, he wrote the following text on the blank sheet of paper:

PO LEUNG KUK 14TH PMWC

On the first line he moved the first letter of each word to the end of the word as follows:

OP EUNGL UKK 4TH1 MWCP

Then he repeated the same procedure on the second line:

PO UNGLE KKU TH14 WCPM

etc.

In what line will

PO LEUNG KUK 14TH PMWC

first occur? Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

Tuesday 23 August

Find the last two digits of $1! + 2! + 3! + \dots + 2010! + 2011!$.

Note that $n! = 1 \times 2 \times 3 \times \dots \times (n - 1) \times n$.

Answer this question and hand full working to Mr Hodsdon in the maths staff room.

The best solution will win a chocolate egg.

Wednesday 24 August

Suppose $1 \times 2 \times 3 \times \dots \times 2010 \times 2011 = 14^n \times A$, where n and A are both positive integers. What is the maximum value of n ? Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

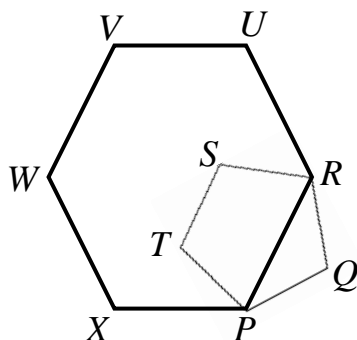
Thursday 25 August

Answers : Monday – 60 , Tuesday – 13 , Wednesday – 333 , .

Tuesday 30 August

In the diagram below, regular hexagon $PRUVWX$ lies on one diagonal PR of regular pentagon $PQRST$.

Find the measure of $\angle SRU$, in degrees. Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.



Wednesday 31 August

How many positive integers less than 100 have exactly four positive divisors? Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

Thursday 1 September

In the number pattern below, in which row and which column will the number **2011** appear? (For example, 23 is on the 3rd row and in the 5th column.)

1	2	9	10	25	...
4	3	8	11	24	
5	6	7	12	23	
16	15	14	13	22	
17	18	19	20	21	

Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

Friday 2 September

Answers : Tuesday – 48, Wednesday – 32 , Thursday – 15th row and 45th column .

Monday 5 September

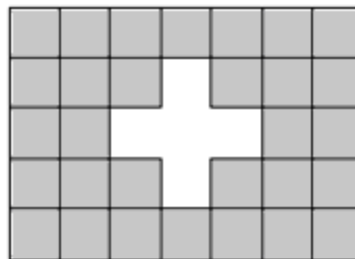
The “*PLK number*” is a positive integer which is both *triangular number* and *square number*. For example, 36 is a “*PLK number*” since $36 = 1+2+3+\dots+8$ (*triangular number*) and $36 = 6 \times 6$ (*square number*). What is the next “*PLK number*” which is greater than 36? Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best solution will win a chocolate egg.

Note: A “*triangular number*” is the sum of the consecutive positive integers beginning with 1, such as $1, 3=1+2, 6=1+2+3, 10=1+2+3+4$, etc.

A “*square number*” is the product of a positive integer multiplied by itself, such as $1=1 \times 1, 4=2 \times 2, 9=3 \times 3, 16=4 \times 4$, etc.

Tuesday 6 September

Dissect the shaded area along the grid line in the diagram below into two pieces and reassemble them to form a 6×5 rectangle. Indicate your answer by drawing a line along the grid on the answer area to show the division line. Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best worked solution will win a chocolate egg.



Wednesday 7 September

Each box in the diagram below contains a multiple of 5 (from 5 to 60) without repetition. Which number will be placed in each box if

- A box never contains its multiple of 5.
(e.g. box 4 may not have $4 \times 5 = 20$ in it)
- 15, 40 and 55 are in successive boxes.
- 5 is in an odd numbered box.
- The number in box 6 is larger than the number in box 8.
- The difference between the numbers in box 8 and box 7 is 5.
- 20 appears in box 2.

- g. The number in box 5 ends in a zero.
- h. The number in box 4 is twice the number in box 12.
- i. 25 is in a box numbered two lower than the box that contains the 35.

Box	1	2	3	4	5	6	7	8	9	10	11	12

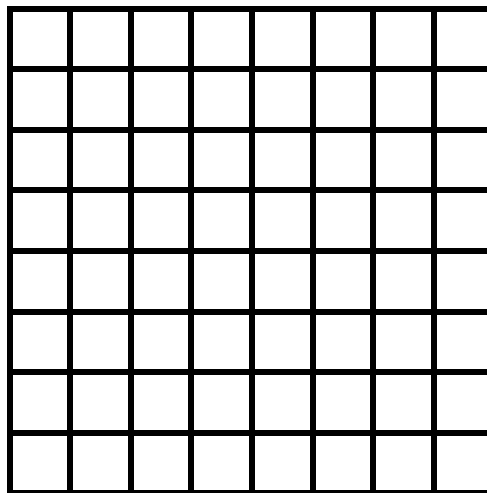
Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best worked solution will win a chocolate egg.

Thursday 8 September

The diagram below shows an 8 by 8 square comprising 64 unit squares. Shade the unit squares so that

- I** all rows have the same number of unit squares shaded **and**
- II** no two columns have the same number of unit squares shaded.

Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best worked solution will win a chocolate egg.

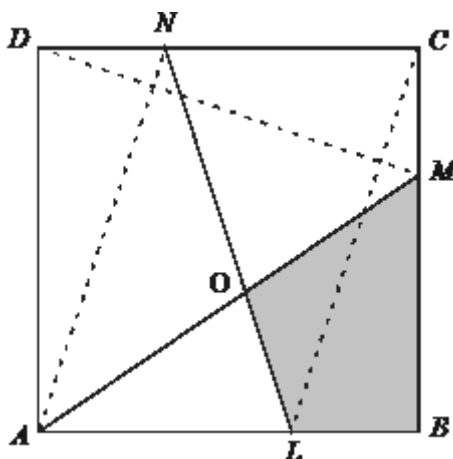


Friday 9 September

Answers : Monday – 1225, other answers on Math Department Notice Board

Monday 12 September

There is a square $ABCD$. Points L , M and N are on the sides AB , BC and CD respectively. Also $AL:LB = BM:MC = CN:ND = 2 : 1$. The sum of the areas of the triangles ADN , DCM and CLB is 2178 cm^2 . Find the area of quadrilateral $BMOL$ in cm^2 , where O is the intersection point of AM and NL . Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best worked solution will win a chocolate egg.



Tuesday 13 September

Analyze all 6-digit numbers from 100000 to 999999. The number is “pretty” if the sum of the first 3 digits equals the sum of the last 3 digits. The number is “elegant” if the sum of odd-placed digits equals the sum of even-placed digits. How many of these numbers are “pretty” and “elegant” at the same time? Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best worked solution will win a chocolate egg.

Wednesday 14 September

The map below shows a country with 6 states A , B , C , D , E and F . Five different colours are available to colour the map such that each state is coloured by only one colour and states sharing the same border cannot have the same colour. Find the number of different ways to colour the map. (Note: all colours need not be used every time) Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best worked solution will win a chocolate egg.

Thursday 15 September

8 men take 5 days to build 12houses how long would it take 15 men take to build 9 houses. Answer this question and hand full working to Mr Hodsdon in the maths staff room. The best worked solution will win a chocolate egg.

Friday 16 September

: Monday –2772 , Tuesday – 6150, Wednesday – 1620 , Thursday - 2