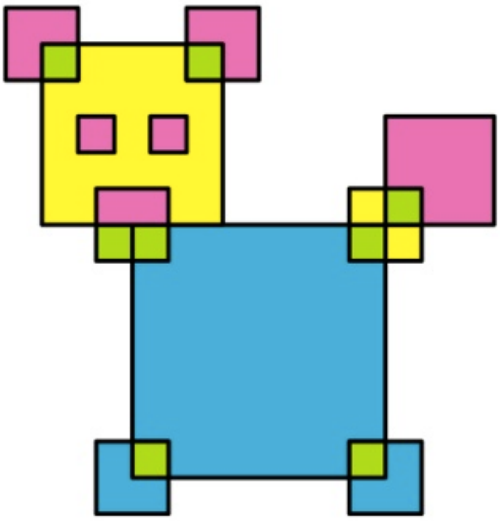
Mathematics Challenge

Issue 122

Dear students and parents, welcome to the Dulwich Mathematics Challenge. Test your brainpower, whatever your mathematical ability. If you would like to contribute a puzzle please email me at chris.stanley@dulwich-beijing.cn



How many squares can you see of any size?

Last week:
1. **A**
2. **B**
3. **B**
4. **45**
5. **1/30**
6. **2 : 1 : 3**

Junior Mathematical Challenge

1. I have lots of 5p and 11p stamps. What is the largest amount I cannot make up using just these two types of stamp?

A 17p B 39p C 43p D 48p E 53p

2. In Morse code each letter is replaced by a sequence of dots and dashes. How many ordinary English words (excluding proper names) are there whose Morse code consists entirely of dots, or entirely of dashes?

A 3 B 4 C 5 D 6 E more than 6

P4

3. I write out all the whole numbers, starting from 1. If I wrote 1994 digits altogether, what was the last number I wrote down?

A 664 B 699 C 700 D 701 E 1994

P10

Junior Mathematical Olympiad

4. Everyone knows that $2 + 2 = 2 \times 2$. Which other pair of numbers a, b satisfy $a + b = a \times b$? Can you find three numbers a, b, c such that $a + b + c = a.b.c$?

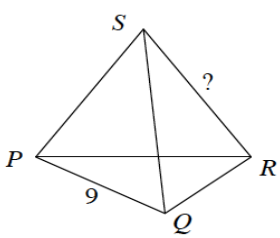
5. ABCD is a square with centre O. A′ is the midpoint of AO, and B′, C′, d′ are the midpoints of BO, CO, DO respectively. The two parallelograms AB′CD′ and A′BC′D overlap. How big is this overlap as a fraction of the square ABCD?

JMO 1993

Intermediate Olympiad

6. Each of the four vertices and six edges of the tetrahedron PQRS is marked with one of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 and 11; so the number 10 is not used. Each number is used exactly once. Each edge is marked with the sum of the numbers at the two vertices connected by that edge. Edge PQ is marked with number 9. What number is used to mark edge RS?

A 4 B 5 C 6 D 8 E 11



Grey 2013