Mathematics Challenge

Issue 123

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

The object of this puzzle is to connect all sixteen stars with exactly six connected straight lines without lifting your pencil off the paper. The lines must go through the centers of the stars.

Last week:
1. **B**
2. **E**
3. **C**
4. **e.g 3, 3/2**
5. **1/3**
6. **B**

Junior Mathematical Challenge

1. The owl and the pussycat went to see if the piggy would sell his ring. The owl asked '*Little pig, are you willing/ To sell for one shilling/ Your ring?' Said the piggy, 'I will'*. They had plenty of money – old pennies, old threepenny bits, and old sixpences. In how many different ways could they pay for the ring? (One old shilling was the same as twelve old pennies.)

A 3 B 7 C 8 D 9 E 12

2. On the London Underground railway system, the Circle Line forms a continuous loop with twenty-seven stations on it. Suppose the underground trains start at 5.30am and run until midnight. The average time taken between stations (including stops) is about 2½ minutes. If a train ran all day without going out of service, approximately how many circuits of the Circle Line would you expect it to make?

A 2½ B 16 C 18½ D 24 E 27

P6

3. ABCD is a square. P and Q are points outside the square such that triangles ABP and BCQ are both equilateral. How big is angle PQB?

A 10° B 15° C 20° D 25° E 30°

JMC 1992

Junior Mathematical Olympiad

4. A cube is made by gluing together a number of unit cubes face-to-face. The number of unit cubes that are glued to exactly four other unit cubes is 96. How many unit cubes are glued to exactly five other unit cubes?

JMO 2013

5. The integer 113 is prime, and its 'reverse' 311 is also prime. How many two-digit primes are there between 10 and 99 which have the same property?

JMO 2014

Intermediate Olympiad

6. How many positive integers are multiples of 2013 and have exactly 2013 factors (including 1 and the number itself)?

A none B 1 C 2 D 3 E 6

Pink 2013