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Po Leung Kuk
16th Primary Mathematics World Contest
Team Contest 2013(Final version)

Team: _____

1. Find the greatest three-digit number $\overline{xyz}$ such that $\overline{x0yz} = 9 \times \overline{xyz}$.

2. Write one of the operators $+, -, \times$ or $\div$ into each of the $\square$ below.

   How many different positive values are there for the expression

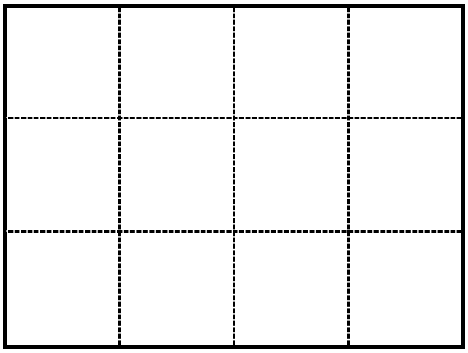
   $2 \square 2 \square 2$?

3. Let A be an integer greater than 3. The remainder of 603 divided by A is twice the remainder of 939 divided by A. This second remainder is twice the remainder of 393 divided by A. What is the number A?

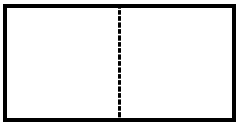
4. Find x if

$$\frac{x}{1\times2\times3}+\frac{x}{2\times3\times4}+\frac{x}{3\times4\times5}+\cdots+\frac{x}{8\times9\times10}=11$$

5. A rectangular wall measuring 3 units by 4 units is to be covered with 6 tiles of different colours, each measuring 1 unit by 2 units. In how many ways can this be done?



wall



tile

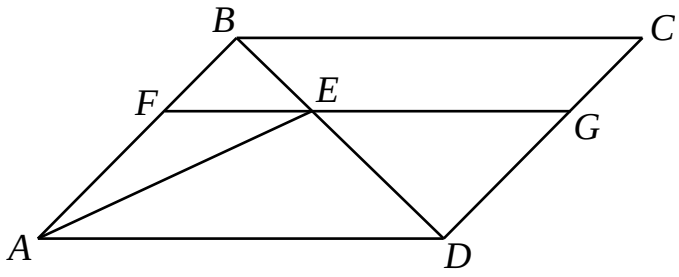
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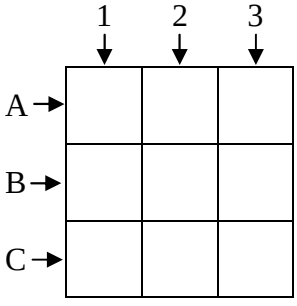
6. How many six-digit numbers of the form $\overline{ababab}$ ($a \neq b$) have exactly 32 positive divisors?

7. Five red blocks and four white blocks are to be placed in a row. At no point in the row may three or more consecutive blocks have the same color. How many such arrangements are possible?

8. In the diagram below, *ABCD* is a parallelogram. *F* and *G* are points on *AB* and *CD* respectively such that *FG* // *AD*. *FG* intersects *BD* at *E*. If the areas of triangle *AEF* and trapezium *BCGE* are 1cm^2 and $2\frac{3}{5}$ cm^2 respectively, find the area of the parallelogram.



9. Solve the following cross-number puzzle.



Across
A. a prime number
B. a prime number
C. a cube

Down
1. a cube
2. a square
3. a square

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10. The circle below has twelve points evenly spaced on its circumference. How many triangles can you make by connecting the points with the following property: the sum of the numbers on the vertices of the triangle created has at least 3 factors greater than 1?

