

First Name _____
Last Name _____
Grade _____
School _____
City _____
RSM Branch _____

**Grades
6-7**

1 In an isosceles triangle, the lengths of two sides are 1000 and 2014. Find the perimeter of the triangle.

2 The measure of the angle between the hour and minute hands of an analog clock is 13 degrees. What is the least possible measure of the angle (in degrees) between these hands 6 hours later? Make sure the answer is a positive number.

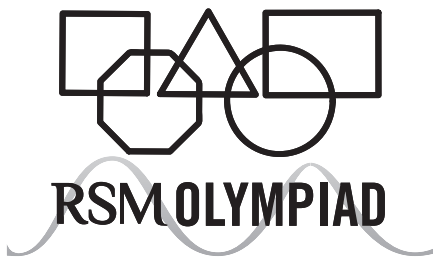
3 Peter walked half of the distance to school at a constant speed X miles per hour. He walked the remaining distance at a constant speed Y miles per hour, and it took him half the total walking time. Compute $100(X - Y)/(X + Y)$.

4 $\frac{1}{3}\%$ of the RSM-Newton students also attend Dance Fever studio, and 1.6% of the students of Dance Fever studio also attend RSM-Newton. There are 500 students in Dance Fever studio. How many students attend RSM-Newton?

5 The Pet Store near RSM has more than twice as many kittens as puppies, more rabbits than mice, more than twice as many mice as kittens, and more than 10 puppies. What is the least possible total number of these animals in the Pet Store?

6 There are 2014 chameleons in the RSM Zoo. Before breakfast some of them were red and all the others were blue. After breakfast half of the previously red chameleons became blue and half of the previously blue chameleons became red. How many red chameleons are there in the RSM Zoo after breakfast?

Please fold over on line. Write answers on back.



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7

Jen thought of a positive integer number X , and found the GCF (greatest common factor) of that number X and 2012. Then she also found the GCF of X and 2013. Then she noticed that $\text{GCF}(X, 2012) + 1 = \text{GCF}(X, 2013)$. What is the smallest possible value of Jen's number X ?

8

Initially all integer numbers are colored white. Then all numbers divisible by 2 are colored red. Then all numbers divisible by 3 are colored white. Then all numbers divisible by 4 are colored red, and so on. After 10,000 such steps, how many positive integers not greater than 2013 would be red?

9

A rectangle with one side 10 and adjacent side X can be cut into exactly 3 squares. Compute the sum of all possible distinct values of X .

10

Rosa, Sara, and Mira have 2013 apples altogether. Rosa and Mira together have twice as many apples as Sara has alone. Sara and Mira together have 10 times as many apples as Rosa has alone. How many apples do Rosa and Sara have together?

11

One day, on the way to school, Jim kept dropping his lunch money. To pick it up, he had to make a few steps backwards several times, without turning around. As a result, his trip to school ended up being 50% longer in distance and 75% longer in time than usual. How many times slower did Jim walk backward than forward, if he walked forward that day at the same constant speed as he usually does? (Assume that it took Jim no time to pick up the dropped money, and that he walked backward at a constant speed that was smaller than his speed walking forward.)

12

The number 2013 is written 10 times sequentially, forming a 40-digit number 20132013...2013. What is the remainder when this big number is divided by 27?

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