

# Math Awareness Month Competition 2010

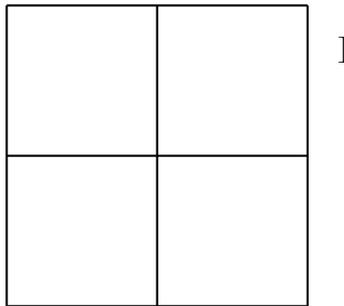
## Solutions for 3rd-4th Grades

1. Alice adds all the numbers from 1 to 20. Bob adds all the numbers from 11 to 30. Tim subtracts Alice's answer from Bob's. What is the number Tim gets?

[Solution: Each number by Alice is 20 more than the corresponding by Bob. The answer is therefore  $20 \cdot 20 = 400$ . Of course, direct calculation is fine.]

2. Paulo is given 12 matches of equal length. He arranges the matches on the table without crossing them and realizes that the figure he constructed has 5 squares. Can you draw what Paulo constructed?

[Solution:



3. A math competition consists of 20 questions. Each question is worth 4 or 5 points. The total number of points available is 84. Mikiko is able to solve all the 4-point questions and half of the 5-point questions. What is Mikiko's score?

[Solution: If the exam had only 4-point questions, the total would have been 80. Since replacing a 4-point by a 5-point increases the total by 1 point, there must be four 5-point questions. So Mikiko misses  $2 \cdot 5 = 10$  points, and her score is 74.]

4. A day such that the sum of the digits of the date is equal to the month is called special. For example, March 12th is a special day since  $1 + 2 = 3$ . November 29th is also special since  $2 + 9 = 11$ . How many special days are there in 2010?

[Solution: The date determines the month, so the number is equal to the number of possible dates, except April 31, so the correct answer is 30. The key is that one only needs to count the dates for each month.]

5. A 4 by 4 inch square piece of paper is cut into two pieces using one straight cut. The perimeters of the pieces are 12 and 14 inches. What is the length of the cut?

[Solution: The cut is counted twice in the perimeters. That is, the sum of the perimeters of the two pieces is the perimeter of the 4 by 4 inch square plus twice the length of the cut. So the answer is 5 inches as  $12 + 14 = 4 \cdot 4 + 2 \cdot 5$ .]