

# Marin Math Circle Elementary Group

## January 25, 2012

### ***Class discussion:***

Can a 5 x 5 square checkerboard be covered by 1 x 2 dominoes? How about 99 x 99 checkerboard?

We discussed adding and multiplying odd and even numbers. We proved that:

even + even = even

even + odd = odd

odd + even = odd

odd + odd = even

even x even = even

even x odd = even

odd x even = even

odd x odd = odd

We also discussed why  $3 \times 5 = 5 \times 3$  by looking at the following picture

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\* \* \* \* \*

\* \* \* \* \*

We can add  $3 + 3 + 3 + 3 + 3$  (5 times, adding columns) or we can add  $5 + 5 + 5$  (3 times, adding rows) and get the same result.

We discussed a fast way to multiply 99 x 99

100 rows, 100 columns

```
*****  
*****  
*****  
.....*  
.....*  
*****  
*****  
*****
```

First multiply 100 x 100 and then subtracting the last row (100, marked red) and the last column (99 = 100 - 1, also marked red).

$$99 \times 99 = 100 \times 100 - 100 - 100 + 1 = 10000 - 200 + 1.$$

We discussed what is a **straight line**, a **plane**, and what lines are called parallel. The next discussion was: Into how many pieces 2 lines, 3 lines cut the plane.

### ***Homework:***

2 corners on one diagonal of a 4x4 checkerboard are cut out. Can one cover this board by 1 x 2 dominoes?