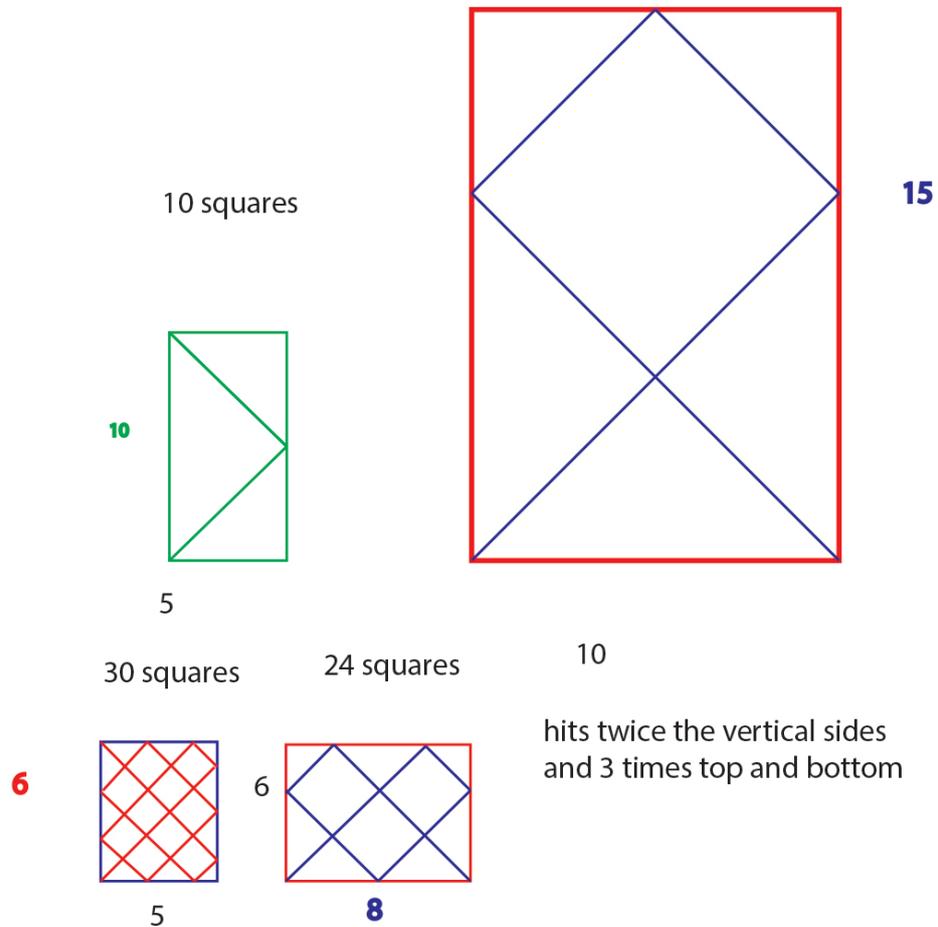


Problems October 25, 2020

Attached below are some examples of billiards we considered during the meeting. The ball starts at the lower left corner, at 45 degree angle.

If the width of the rectangle is a and the height is b (where a, b are integers), based on these and other examples can you guess:

- 1) What corner the ball is going to end up in, based on a and b ?
- 2) How many times is hits top and bottom (in total), and left and right sides (in total)?



10 squares

10

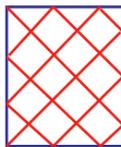
5

30 squares

24 squares

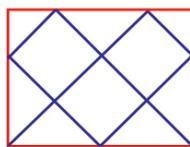
10

6



5

6



8

hits twice the vertical sides and 3 times top and bottom

The number of 1×1 squares that the ball hits equals the least common multiples of the two sides!

The ball hits the two a -sides of the $a \times b$ rectangles many times