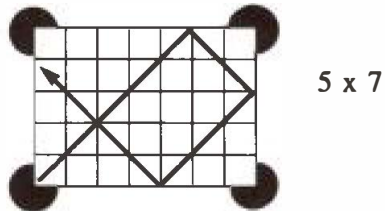


Snooker Sam Gets Rich

A. Craig Loewen

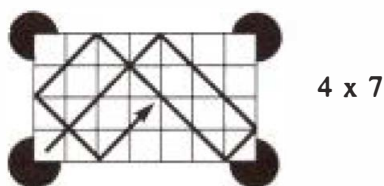
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Snooker Sam was a sneaky sort
with that old snooker show.
He'd pack up his tables of varied size,
and off to work he would go.
On one sunny day, Sam rolled into town,
and set up his show in the mall.
And as the townsfolk gathered around,
they heard old Snooker Sam call:
"You see," said Snooker Sam, laying the bait,
"I'm a simple man, and honest, no less.
But if you'll give me a problem, with these tables here,
I'll bet I'm right whenever I guess.
If I set a ball at this corner here,"
and he pointed to the lower left with a grin,
"And I hit the ball diagonally, I wonder,
Can you guess which pocket it will fall in?"



Now the table Sam used was five foot by seven,
and at first the crowd didn't dare guess.
"You don't know either" came a cry from the back.
"Well," said Sam, "lets run this little test."
And with those words Sam struck the ball, and
it rolled from one edge to the other.
And as it rolled, he called "upper right,"
"Sure enough," cried the crowd, "Do another!"

“I’ll tell you what,” said the sneaky chap,
 “Lets try this other table of mine.
 It is four foot by seven, and the same rules apply, but
 the ball will drop upper left, this time.”



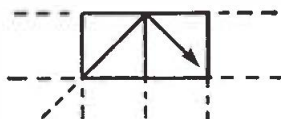
“Uh-uh,” said one. “You’re wrong,” said another.
 Said Sam, “Lets just try it and see,” and
 As I’m sure you have guessed, Sam was right once again
 and it silenced them all quite effectively.
 “How does he know? How does it work?”
 Rang the incredulous cry through the crowd.
 “Listen to me, I know!” said one little boy,
 though he said it not very loud.
 “Well, I’ll do another, but it will cost you a dollar.
 If I guess right, the dollar is mine.
 If I am wrong,” said the sneak, “The money is yours
 and I’ll not take up more of your time.”

So the afternoon went, and on into the night
 Sam continued to take money from the folk.
 If only they had listened to that one little boy,
 They’d have known it was just a cruel joke.
 Now if you would like to be rich like Sam,
 then you will have to know what he knows.
 But, as for Sam, he’s retired now;
 one little boy put a stop to his shows.

How could Sam possibly predict the pocket that the ball would fall into regardless of the length of the sides of the table?

Here is another look at the rules:

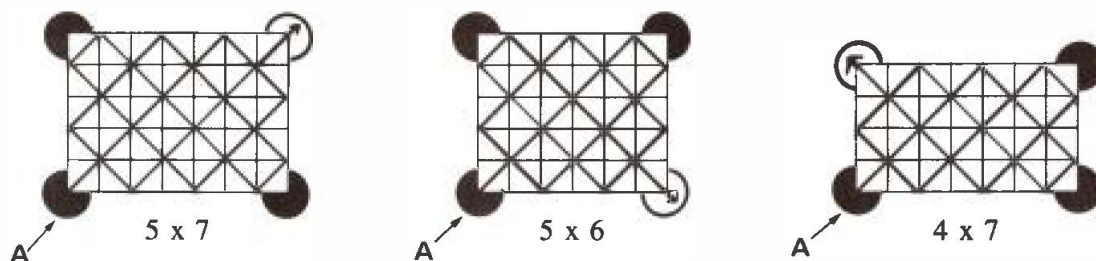
1. Each table is flat and rectangular.
2. Each table has only four pockets, one in each corner.
3. The ball always starts in the lower left.
4. The ball is hit diagonally at 45 degrees to the bottom wall.
5. When the ball collides with a wall, it rebounds to form a 90-degree angle.



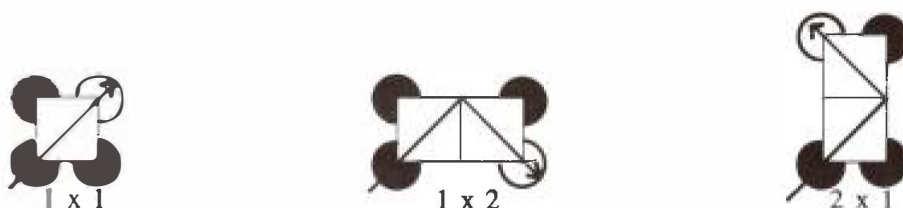
6. The ball continues traveling until it falls into one of the four pockets.

Solution

To solve this problem, consider some of the same table dimensions that Sam used.



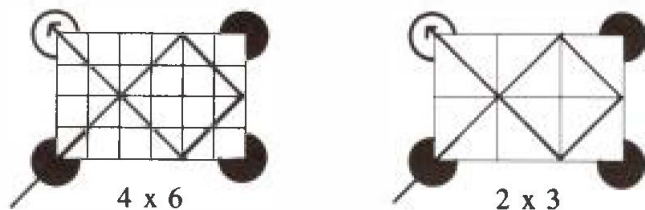
The ball always originates at Point A, so leave the bottom and left edges alone. If you remove the right-most column from the 5 x 7 table, you have an identical pattern to that of the 5 x 6 table. Likewise, if you take the top row off of the 5 x 7 table you are left with 4 x 7 table. In this manner, you can continue to strip off rows and columns until such time as you have one of these three trivial cases:



From these cases, it can be seen that any “odd by odd” table will land the ball in the upper right pocket while any “odd by even” table lands the ball in the lower right pocket, and any “even by odd” table lands the ball in the upper left pocket.

Each table is actually built upon the smaller tables which precede it in the series, and it is this property which dictates the pocket into which the ball will fall.

Be careful! Tables must be expressed in their lowest terms. For example, a 4 x 6 table is really just a 2 x 3 table.



Equal scaling horizontally and vertically does not change the pocket in which the ball will fall.

Can you think of other variations or solutions to this problem?