Pouring Water

1. Given a 5-liter unmarked container, a 3-liter unmarked container, and an unlimited supply of water, can you obtain an accurate measure of 4 liters of water?

You can keep track of your pourings here.

5-liter	3-liter	5-liter	3-liter
0	0	0	0
5	0	0	3

Could you also obtain an accurate measure of 1 L of water? 2 L? 3 L? 6 L?

2. Given a 4-liter unmarked container, a 7-liter unmarked container, and an unlimited supply of water, can you obtain an accurate measure of 5 liters of water? If so, what is the minimum number of pourings necessary?

4-liter	7-liter	4-liter	7-liter
0	0	0	0
4	0	0	7

Could you also obtain an accurate measure of 1 L of water? 2 L? 3 L? 6 L?

3. Under the same conditions, but with a 3-liter container and a 6-liter container, can you obtain a measure of 5 liters? If so, what is the minimum number of pourings necessary?

3-liter	6-liter	3-liter	6-liter
0	0	0	0
3	0	0	6

4. Given a 5-liter unmarked container, a 9-liter unmarked container, and an unlimited supply of water, can you obtain an accurate measure of 6 liters of water? If so, what is the minimum number of pourings necessary?

5-liter	9-liter	5-liter	9-liter
0	0	0	0
5	0	0	9

5. On the pool table shown below, a pool ball must be shot initially from the point (0,0) and must roll along the side to either (0,3) or (5,0). Each time the ball strikes another side, it will bounce off at an angle of 60° as indicated by the dotted lines. First, start at (0,0), and shoot the ball towards (5,0), and record the coordinates each time the ball strikes a side. Then start at (0,0), shoot the ball towards (0,3), and record the coordinates again. Can you relate your results to the previous problem?

