



Problem of the Week

Problem B and Solution

Right On Target!



Problem

Samina likes to practice darts using a board similar to the one shown. She shoots six darts and they all land on the board. Her score is the sum of the numbers on the rings in which her darts land.

- Could Samina's score ever be 56? If yes, show how it can be done. If no, explain why the sum 56 cannot be obtained.
- Show how Samina could score 12? Show how she could score 8?
- There is more than one possible way to score 28? Find as many different ways as you can to score 28.
- Is it possible to get an odd score? If yes, show a possibility. If no, explain why an odd sum cannot be obtained.

Solution

- Since the maximum possible score is $6 \times 9 = 54$, Samina could not score 56.
- Samina could score 12 in six shots in three different ways:
 $1 + 1 + 1 + 3 + 3 + 3$, or $1 + 1 + 1 + 1 + 3 + 5$, or $1 + 1 + 1 + 1 + 1 + 7$.
 Samina could score 8 in six shots by getting $1 + 1 + 1 + 1 + 1 + 3$.
- Yes. In fact, a score of 28 can be achieved in at least sixteen ways. Did you find any more?

9s	7s	5s	3s	1s	Score
2	1	0	0	3	$9+9+7+1+1+1=28$
2	0	1	1	2	$9+9+5+3+1+1=28$
2	0	0	3	1	$9+9+3+3+3+1=28$
1	2	0	1	2	$9+7+7+3+1+1=28$
1	1	2	0	2	$9+7+5+5+1+1=28$
1	1	1	2	1	$9+7+5+3+3+1=28$
1	1	0	4	0	$9+7+3+3+3+3=28$
1	0	3	1	1	$9+5+5+5+3+1=28$
1	0	2	3	0	$9+5+5+3+3+3=28$
0	3	1	0	2	$7+7+7+5+1+1=28$
0	3	0	2	1	$7+7+7+3+3+1=28$
0	2	2	1	1	$7+7+5+5+3+1=28$
0	2	1	3	0	$7+7+5+3+3+3=28$
0	1	4	0	1	$7+5+5+5+5+1=28$
0	1	3	2	0	$7+5+5+5+3+3=28$
0	0	5	1	0	$5+5+5+5+5+3=28$

- If all darts land in the board, an odd score is not possible, since the sum of six odd numbers must be an even number.

