

Pot Black

By Oyler

Solution

In what follows the abbreviation tn is used for a triangular number.

- A tn must end in either 0, 1, 3, 5, 6 or 8.
- 24ac must start with 1.
- The frame starts in the evening and finishes before midnight which gives six possible times to be considered : 1830 = 2.3.5.61, 1953 = 3.3.7.31, 2016 = 2.2.2.2.2.3.3.7, 2145 = 3.5.11.13, 2211 = 3.11.67 and 2346 = 2.3.17.23. Can't start at 1830 or 2016 as 2dn and 3dn can't start with zero. So the earliest start time is 1953 and the finish time starts with a 2.
- 21dn is a tn and no tn ends in 4 so the frame finishes at 2016 or 2211.
- 3dn HCF (1953,2016) = 63, HCF (1953, 2211) = 3, HCF (2145, 2211) = 33. The middle pair can be ruled out. The first pair has 3dn as 36 and the last pair has 3dn as 53. 3dn is a factor of 8ac a square number and as 53 is prime we would have a 4-digit entry and not 3-digit as required. 1ac is 1953, 25ac is 2016, 3dn is 36 and 6ac is 63.
- 8ac with square numbers that have a factor of 36 are 144, 324, 576 and 900. The first can be discounted as Barry would be 12 and it's an adult tournament and the last has 9dn starting with zero.
- 22ac is a 2-digit tn and must end in 1, 5, 6 or 8 and not 0 from 23dn. 23dn can be 12, 52, 62 or 82. Of these only 12 can be a factor of 8ac so 23dn is 12.
- 22ac is 21 or 91. If it is 91 then 2dn is 910 but we know 2dn ends in a 2 or 7. Thus 22ac is 21.
- 2dn multiples of 21 in the 9** are 903, 924, 945, 966 and 987. Of these only the last one fits so 2dn is 987 and 8ac is 576 [Barry is 24].
- 9dn is 66.

- 13dn can be 378 or 630. We can discount the latter as we are told that the scores are tied so there are an odd number of frames in the match. So 13dn is 378.
- 19dn must be 52 and 12ac 13. We can discount 92 and 23 as cues aren't 92 inches long!! 18ac must be 625 [Hugh is 25]. 15dn must end in a 0 or 5 from 18ac and can be 105 or 153.
- 17dn is in the range 27 to 35 inclusive and from 25ac can be 28 or 32. From 5dn it must be 32 so 7dn is 34 and 11ac is 67.
- 21dn must be less than 378 and a tn ending in 1 which gives 171, 231 and 351 as possible entries. No multiples of 12 end in 18 or 38 but do in 28. So 21dn is 231 and 20ac is 228.
- 8dn is 528 or 594.
- 15dn can only be 3655 as it must start with a 1, 3, 7 or 9 from 14ac and 3655 is a multiple of 43. 14ac is 43, 8dn is 594 and 24ac is 153.
- 4ac is a tn which must be greater than 594 [8dn] which is the largest number already in the grid that has to do with the spectators and 5dn is the product of the players' scores and one is 67. As the frame was decided on the black then the other score is in the range 53 to 81. We have two possible entries to consider 53 and 73 which give a product of 3551 and 4891.
- 4ac can be 630, 741 or 946. We can eliminate 946 as it is a multiple of 14ac. Using 630 gives 4*5 for 10ac and there are no multiples of 67 or 53 of that form so 4ac is 741, 5dn is 4891, 16ac is 73.
- 10ac is 469 which is a multiple of 67 which is Hugh's score so Barry won.

The final grid is as follows

1	9	5	3	█	7	4	1
█	8	█	6	3	█	8	█
5	7	6	█	4	6	9	█
9	█	6	7	█	█	1	3
4	3	█	█	7	3	█	7
█	6	2	5	█	2	2	8
█	5	█	2	1	█	3	█
1	5	3	█	2	0	1	6

Winner : Barry ' The Potter ' Cotter. Score 73 – 67.

Note. Any form for the winner is acceptable, so Barry, Cotter or The Potter or any combination is fine.