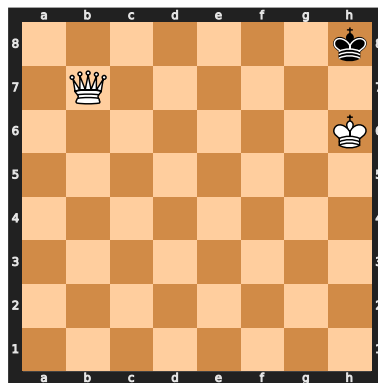


"It's A Set Up!" Puzzle Contest - The Solutions

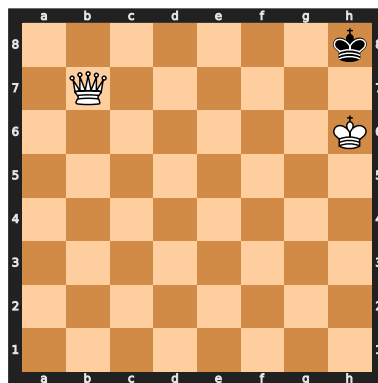
Challenge 1

White has exactly five ways to mate in one.

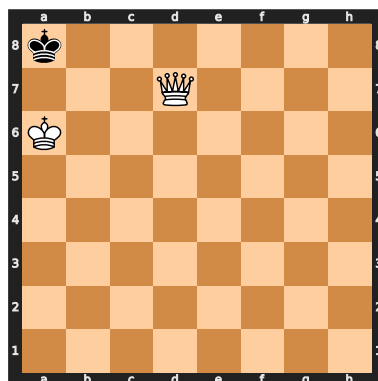
A gentle start to the contest! Many entrants identified that the best solution is a three-unit 'King and Queen versus King' position with the Queen placed appropriately on the seventh rank (or an equivalent rotation):



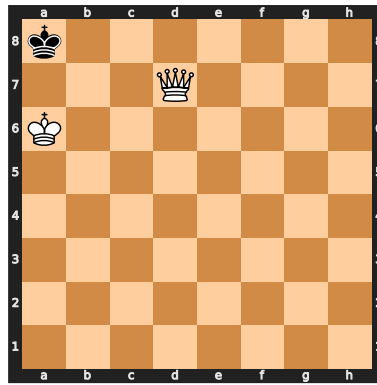
Challenge 1 | Luke Garner | Score: 47
7k/1Q6/7K/8/8/8/8/8



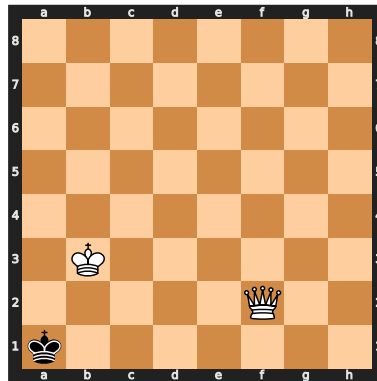
Challenge 1 | GM John Nunn | Score: 47
7k/1Q6/7K/8/8/8/8/8



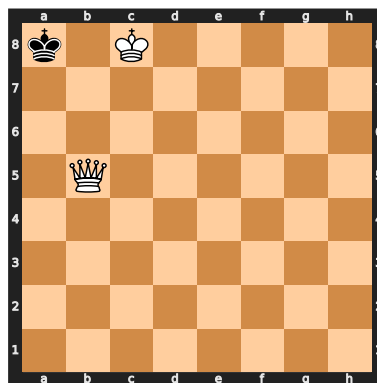
Challenge 1 | Mike Waddington | Score: 47
k7/3Q4/K7/8/8/8/8/8



Challenge 1 | Sample solution (Tim Paulden) | Score: 47
k7/3Q4/K7/8/8/8/8/8



Challenge 1 | Giles Body | Score: 47
8/8/8/8/1K6/5Q2/k7

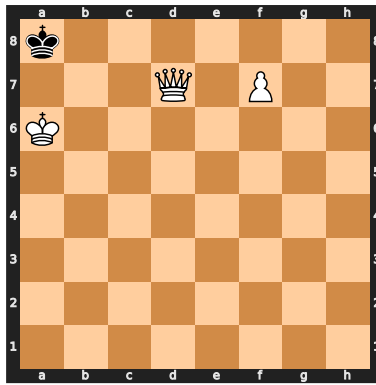


Challenge 1 | Alex Fletcher | Score: 47
k1K5/8/8/1Q6/8/8/8/8

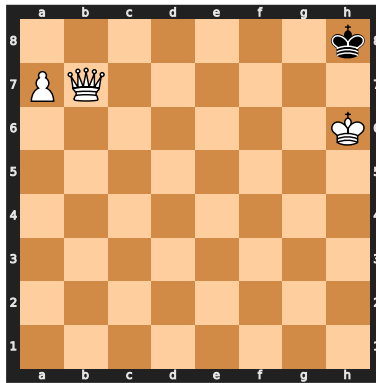
Challenge 2

White has exactly seven ways to mate in one.

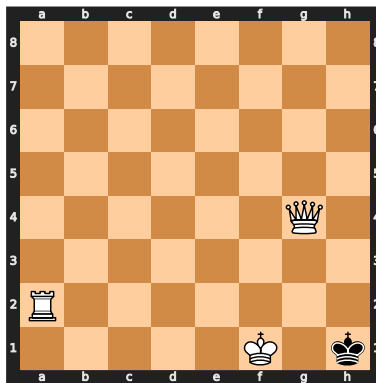
Building on Challenge 1, adding a seventh-rank pawn on the far side of the Queen gives two extra mates (via promotion to Queen or Rook) - though several alternatives exist:



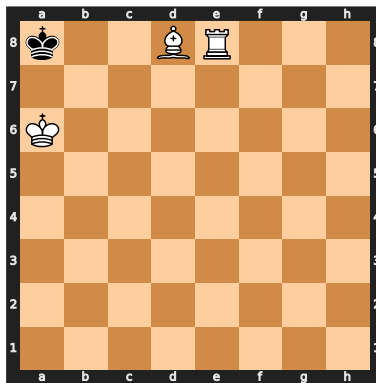
Challenge 2 | Mike Waddington | Score: 46
k7/3Q1P2/K7/8/8/8/8



Challenge 2 | GM John Nunn | Score: 46
7k/PQ6/7K/8/8/8/8



Challenge 2 | Alex Fletcher | Score: 46
8/8/8/6Q1/8/R7/5K1k

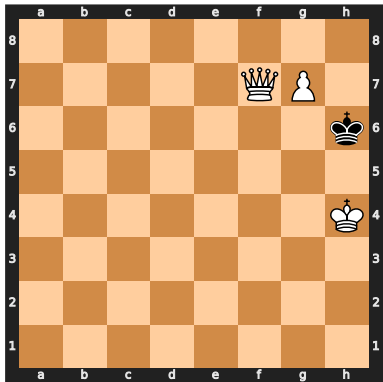


Challenge 2 | Sample solution (Tim Paulden) | Score: 46
k2BR3/8/K7/8/8/8/8

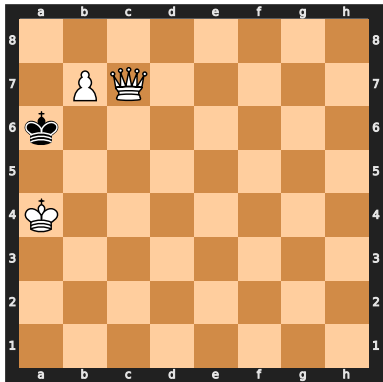
Challenge 3

White has exactly one way to mate in one, and it's by promoting to a Knight (with the promotion move being a Pawn advance, rather than a capture).

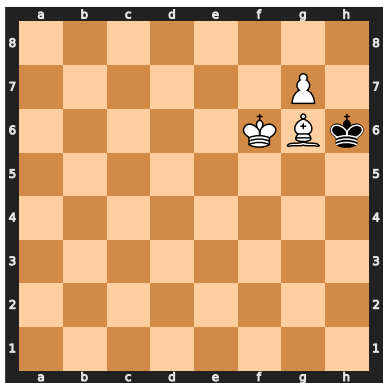
Several entrants found a four-unit solution in which Black's king stands on a6 or h6:



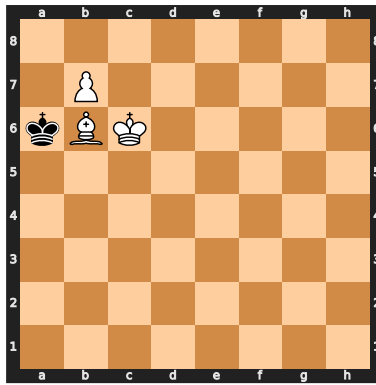
Challenge 3 | Alex Fletcher | Score: 46
8/5QP1/7k/8/7K/8/8/8



Challenge 3 | John Bass | Score: 46
8/1PQ5/k7/8/K7/8/8/8



Challenge 3 | Luke Garner | Score: 46
8/6P1/5KBk/8/8/8/8/8

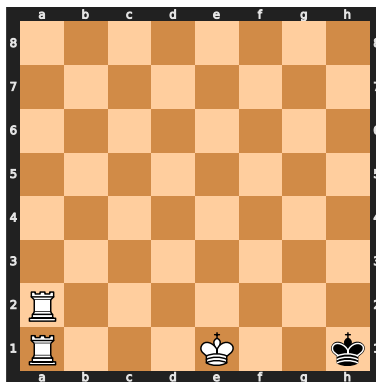


Challenge 3 | Sample solution (Tim Paulden) | Score: 46
8/1P6/kBK5/8/8/8/8/8

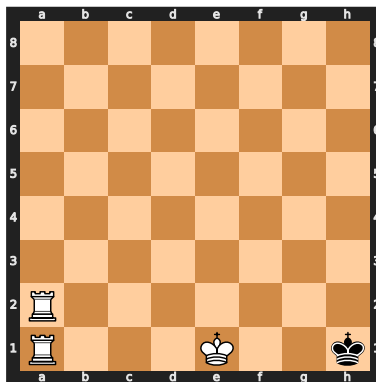
Challenge 4

White has exactly one way to mate in one, and it's by playing O-O-O#. (You can assume that the White Rook on a1 and the White King on e1 haven't moved.)

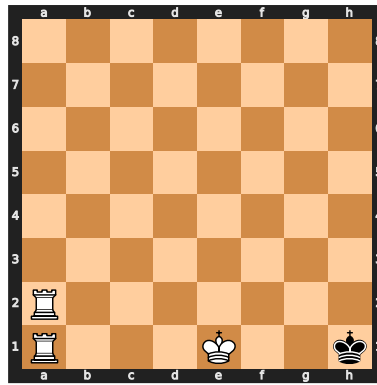
Placing the other White Rook on the second rank (between a2 and d2) and the Black King on g1 or h1 gives a four-unit solution:



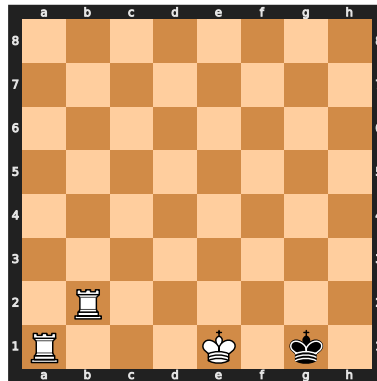
Challenge 4 | Alex Fletcher | Score: 46
8/8/8/8/8/R7/R3K2k



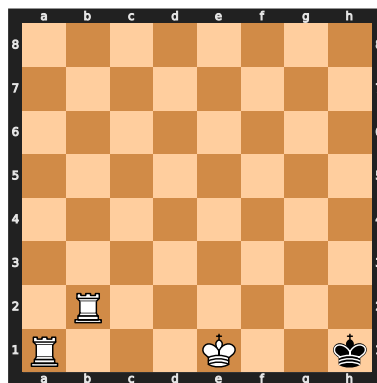
Challenge 4 | Giles Body | Score: 46
8/8/8/8/8/R7/R3K2k



Challenge 4 | GM John Nunn | Score: 46
8/8/8/8/8/R7/R3K2k



Challenge 4 | Mike Waddington | Score: 46
8/8/8/8/8/1R6/R3K1k1

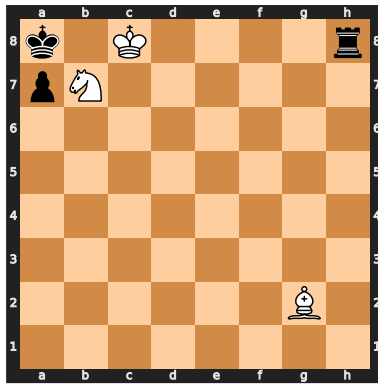


Challenge 4 | Sample solution (Tim Paulden) | Score: 46
8/8/8/8/8/1R6/R3K2k

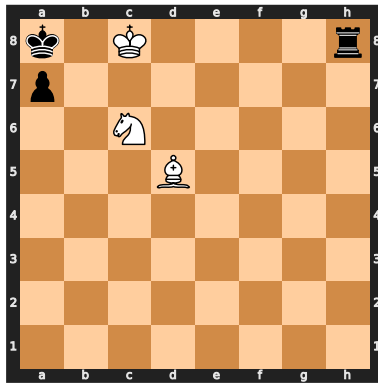
Challenge 5

White has exactly one way to mate in one, and it's by playing Nd8#, even though Black's King stands on a corner square (a1, a8, h1, or h8).

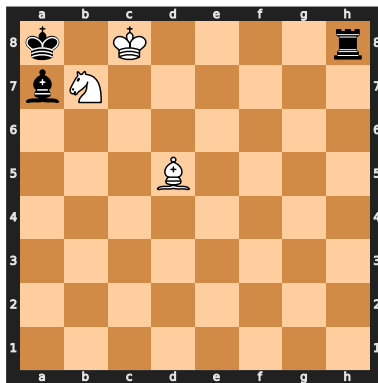
The best solutions (with six units) were remarkably similar - in each case, the Knight's move discovers a diagonal check to Black's king on a8, and also gets White's King out of check (which is a neat way to ensure that the mating move is unique):



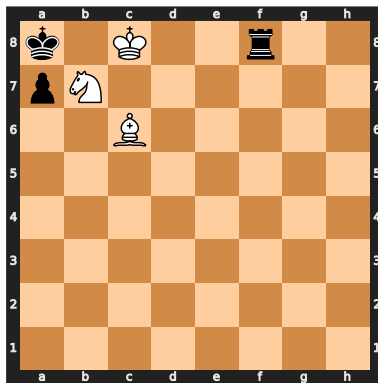
Challenge 5 | Alex Fletcher | Score: 44
k1K4r/pN6/8/8/8/6B1/8



Challenge 5 | GM John Nunn | Score: 44
k1K4r/p7/2N5/3B4/8/8/8/8



Challenge 5 | Mike Waddington | Score: 44
k1K4r/bN6/8/3B4/8/8/8/8

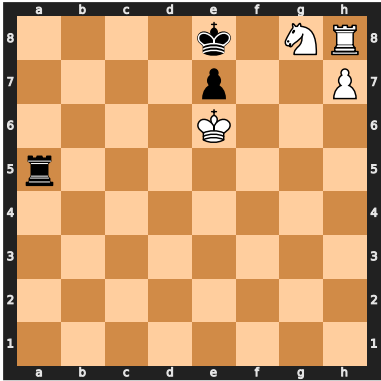


Challenge 5 | Sample solution (Tim Paulden) | Score: 44
k1K2r2/pN6/2B5/8/8/8/8/8

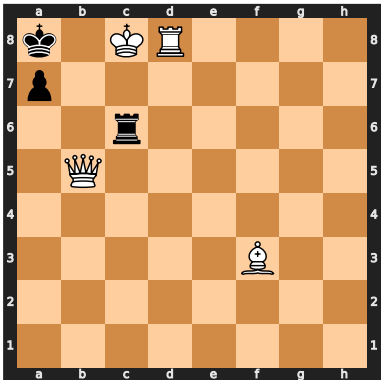
Challenge 6

White has exactly three legal moves, all of which are mate in one.

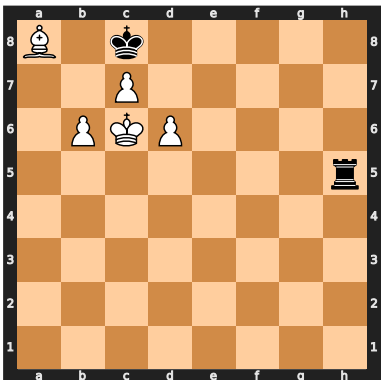
Three entrants found a seven-unit solution (see below), but in fact a six-unit solution is possible, as shown in the fourth diagram.



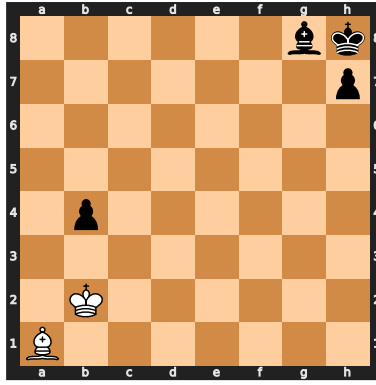
Challenge 6 | John Bass | Score: 43
4k1NR/4p2P/4K3/r7/8/8/8



Challenge 6 | Alex Fletcher | Score: 43
k1KR4/p7/2r5/1Q6/8/5B2/8/8



Challenge 6 | GM John Nunn | Score: 43
B1k5/2P5/1PKP4/7r/8/8/8/8

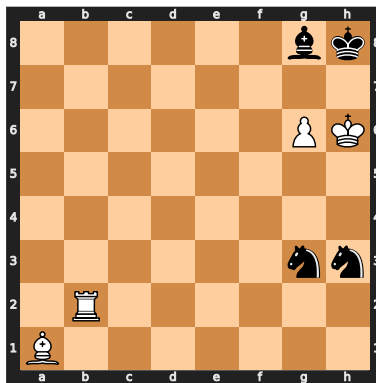


Challenge 6 | Sample solution (Tim Paulden) | Score: 44
6bk/7p/8/8/1p6/8/1K6/B7

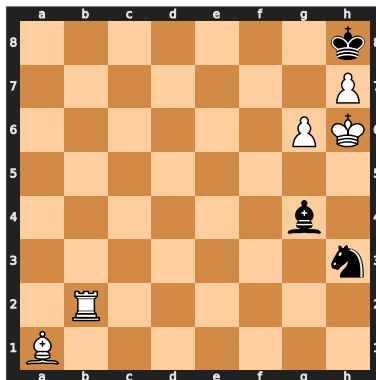
Challenge 7

White has fifteen or more legal moves, all of which are mate in one.

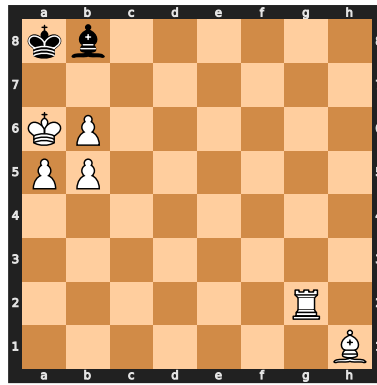
Once again, the best solutions (with eight units) were remarkably similar - the combination of a corner-square Bishop and diagonally adjacent Rook generates fourteen different mates, with one further mate provided by a pawn:



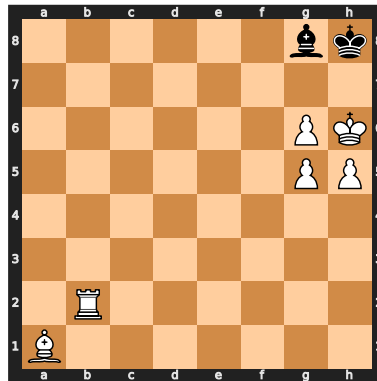
Challenge 7 | GM John Nunn | Score: 42
6bk/8/6PK/8/8/6nn/1R6/B7



Challenge 7 | Alex Fletcher | Score: 42
7k/7P/6PK/8/6b1/7n/1R6/B7



Challenge 7 | Giles Body | Score: 42
kb6/8/KP6/PP6/8/8/6R1/7B

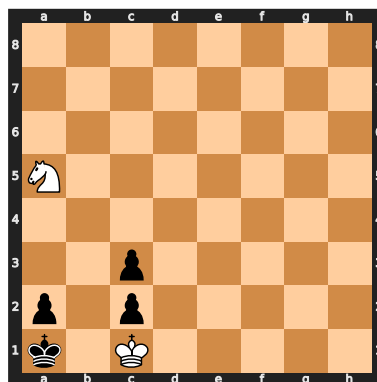


Challenge 7 | Sample solution (Tim Paulden) | Score: 42
6bk/8/6PK/6PP/8/8/1R6/B7

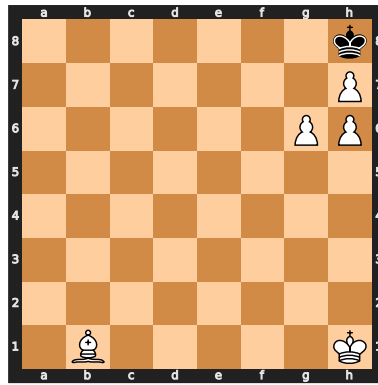
Challenge 8

White has exactly one way to mate in one, with all other legal moves placing Black in immediate stalemate.

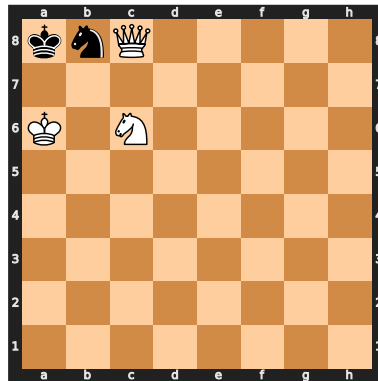
A couple of different six-unit solutions were exhibited by entrants (see below). Somewhat surprisingly, solutions with just five units can be constructed - these positions typically rely on White being placed in check by Black's previous move to reduce the available options (as shown in the third and fourth diagrams below).



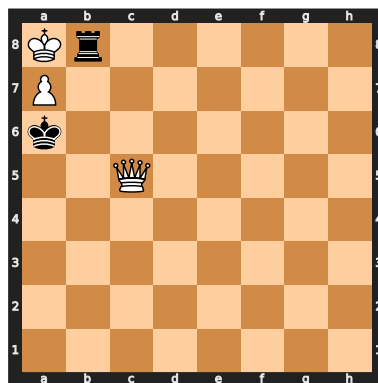
Challenge 8 | Alex Fletcher | Score: 44
8/8/8/N7/8/2p5/p1p5/k1K5



Challenge 8 | GM John Nunn | Score: 44
7k/7P/6PP/8/8/8/1B5K

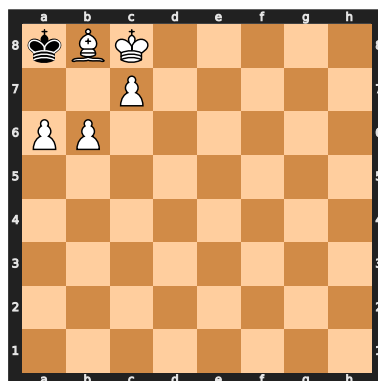


Challenge 8 | Sample solution #1 (Tim Paulden) | Score: 45
knQ5/8/K1N5/8/8/8/8



Challenge 8 | Sample solution #2 (Tim Paulden) | Score: 45
Kr6/P7/k7/2Q5/8/8/8

Unfortunately, one six-unit position received a ten-point penalty for being retro-illegal (i.e. it could not have arisen in a legally played game):

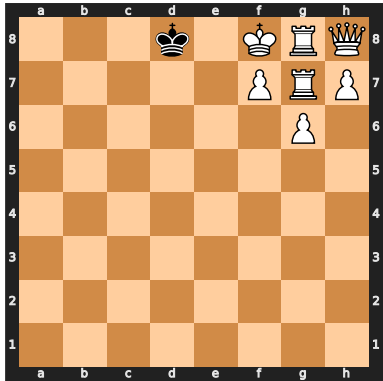


Challenge 8 | Mike Waddington | Score: 34 (Penalty: -10)
kBK5/2P5/PP6/8/8/8/8

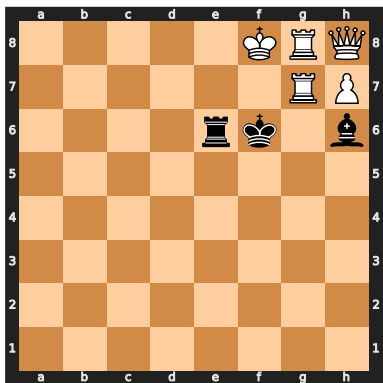
Challenge 9

White has no legal moves (i.e. White is stalemated) despite White having at least 20 'points' of material (where Q=9, R=5, B=3, N=3, P=1, and the King isn't counted).

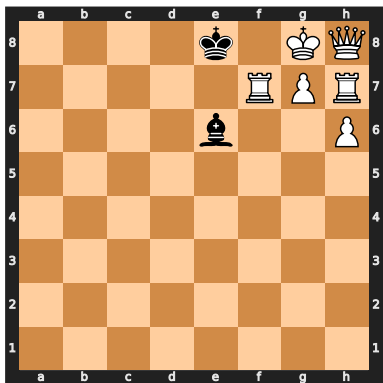
Solvers identified several neat eight-unit solutions, with White's units either being pinned or blocked by their own pawns:



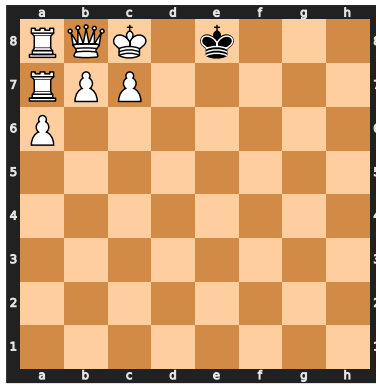
Challenge 9 | GM John Nunn | Score: 42
3k1KRQ/5PRP/6P1/8/8/8/8/8



Challenge 9 | Alex Fletcher | Score: 42
5KRQ/6RP/4rk1b/8/8/8/8/8



Challenge 9 | Ellis Manning | Score: 42
4k1KQ/5RPR/4b2P/8/8/8/8/8

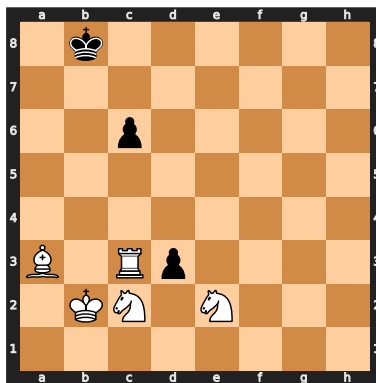


Challenge 9 | Sample solution (Tim Paulden) | Score: 42
RQK1k3/RPP5/P7/8/8/8/8/8

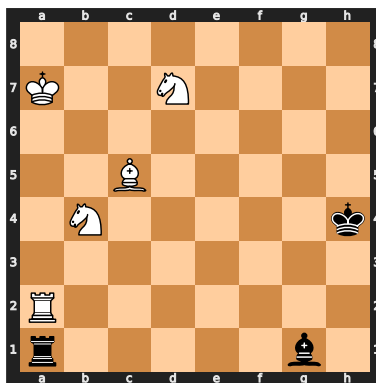
Challenge 10

White has exactly five units (including the King), and each White unit has exactly five legal moves – moreover, if the position were 'Black to move' instead, the Black King would also have exactly five legal moves. (Note: The position must be legal with White to move and with Black to move, so neither King can be in check.)

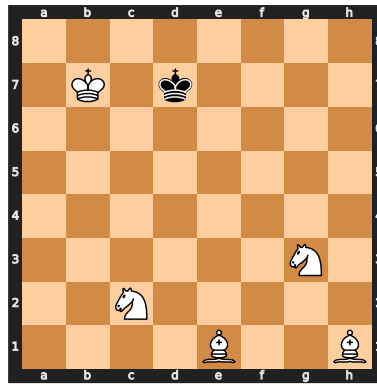
Two entrants found eight-unit solutions (see first two diagrams below), while two others used just six units - with White's army comprising the four minor pieces plus the King (see subsequent diagrams):



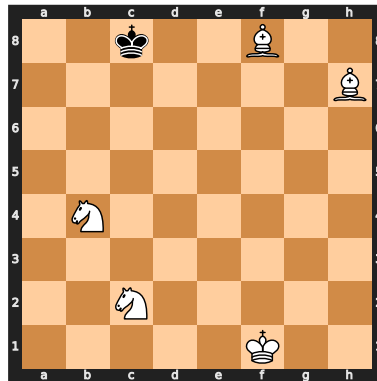
Challenge 10 | Ellis Manning | Score: 42
1k6/8/2p5/8/8/B1Rp4/1KN1N3/8



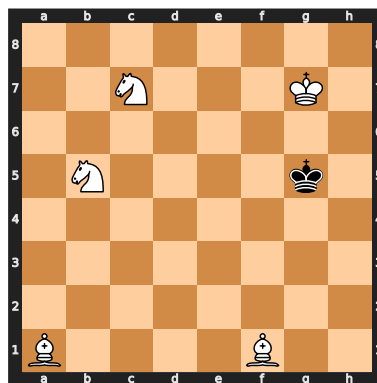
Challenge 10 | Giles Body | Score: 42
8/K2N4/8/2B5/1N5k/8/R7/r5b1



Challenge 10 | Alex Fletcher | Score: 44
8/1K1k4/8/8/6N1/2N5/4B2B



Challenge 10 | GM John Nunn | Score: 44
2k2B2/7B/8/8/1N6/8/2N5/5K2



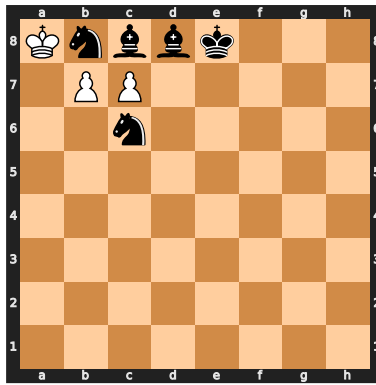
Challenge 10 | Sample solution (Tim Paulden) | Score: 44
8/2N3K1/8/1N4k1/8/8/8/B4B2

Challenge 11

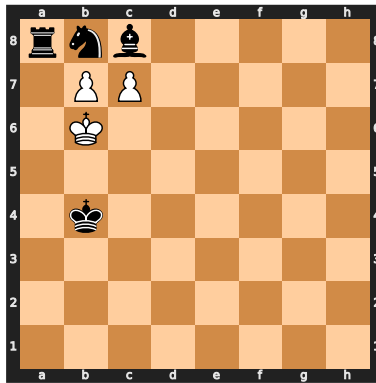
White has exactly twelve legal moves, all of which are captures.

The best solutions met the challenge criteria by including White pawns on the seventh rank that could promote with a capture, since the four different promotion options are counted as different moves.

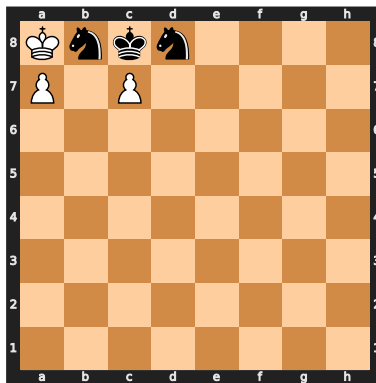
Alex Fletcher was the 'challenge winner' for finding a seven-unit solution (see second diagram below). A six-unit solution can in fact be constructed by ensuring one of the Black units can be captured by two White pawns (see third diagram below):



Challenge 11 | Luke Garner | Score: 42
Knbbk3/1PP5/2n5/8/8/8/8/8

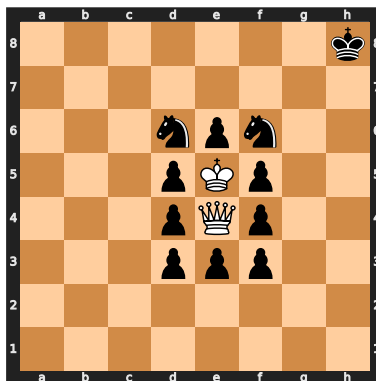


Challenge 11 | Alex Fletcher | Score: 43
rnb5/1PP5/1K6/8/1k6/8/8/8



Challenge 11 | Sample solution (Tim Paulden) | Score: 44
Knkn4/P1P5/8/8/8/8/8/8

Notably, this was the only challenge in which our overall winner dropped more than two points, with the attractive (and promotion-free) thirteen-unit solution below:

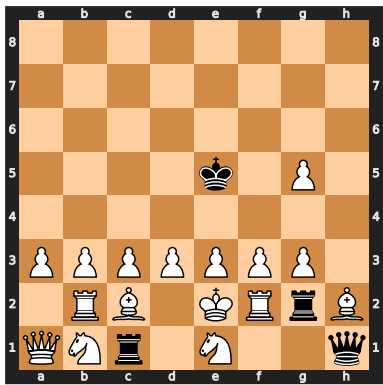


Challenge 11 | GM John Nunn | Score: 37
7k/8/3npn2/3pKp2/3pQp2/3ppp2/8/8

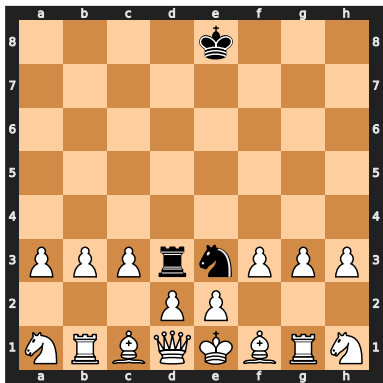
Challenge 12

White still has all sixteen original White units, and each White unit has exactly one legal move (thus, White has sixteen legal moves overall).

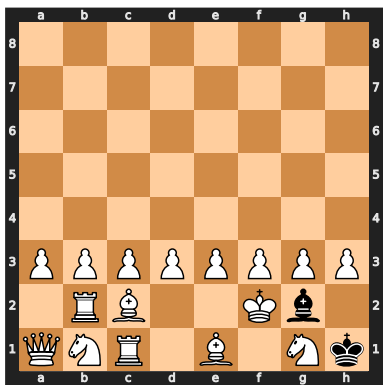
All entrants successfully found a valid solution, with the number of units ranging from twenty down to seventeen (which is, of course, optimal). Several solutions placed all eight White pawns across the third rank - and with some experimentation, a pleasingly symmetric solution can in fact be achieved (see final diagram below).



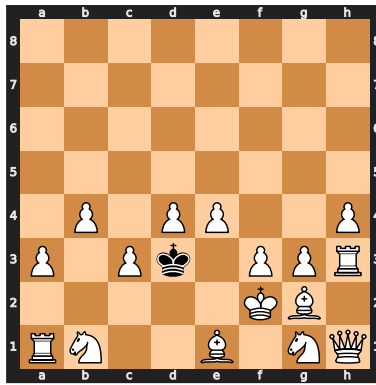
Challenge 12 | Giles Body | Score: 30
8/8/8/4k1P1/8/PPPPPPP1/1RB1KRrB/QNr1N2q



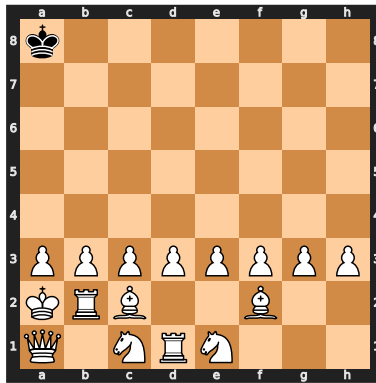
Challenge 12 | John Bass | Score: 31
4k3/8/8/8/PPPPmPPP/3PP3/NRBQKBRN



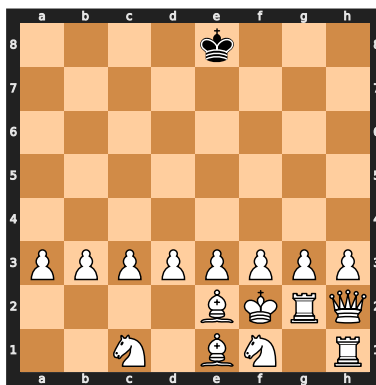
Challenge 12 | GM John Nunn | Score: 32
8/8/8/8/PPPPPPPP/1RB2Kb1/QNR1B1Nk



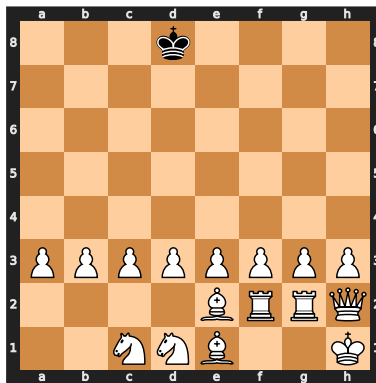
Challenge 12 | Ellis Manning | Score: 33
8/8/8/1P1PP2P/P1PK1PPR/5KB1/RN2B1NQ



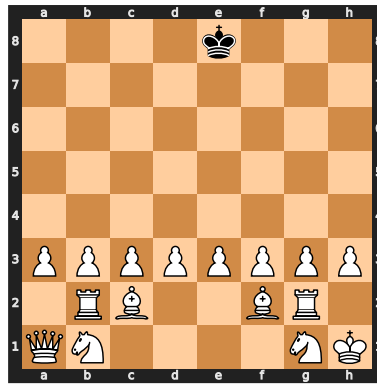
Challenge 12 | Alex Fletcher | Score: 33
k7/8/8/8/PPPPPPPP/KRB2B2/Q1NRN3



Challenge 12 | Luke Garner | Score: 33
4k3/8/8/8/PPPPPPPP/4BKRQ/2N1BN1R



Challenge 12 | Mike Waddington | Score: 33
3k4/8/8/8/PPPPPPPP/4BRQ/2NNB2K

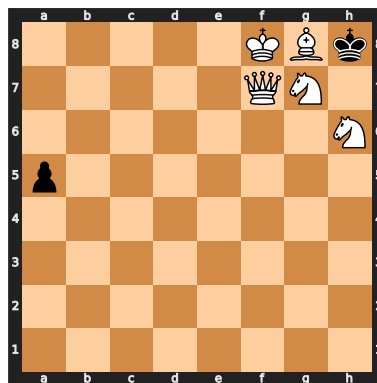


Challenge 12 | Sample solution (Tim Paulden) | Score: 33
4k3/8/8/8/PPPPPPPP/1RB2BR1/QN4NK

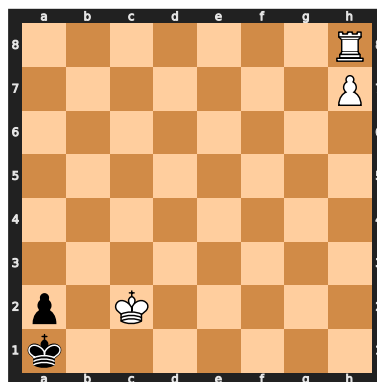
Challenge 13

White has no mate in one, but if any White unit (excluding the King) is removed, White does have mate in one. (Note: The position is invalid if any of the possible unit removals would place Black in check.)

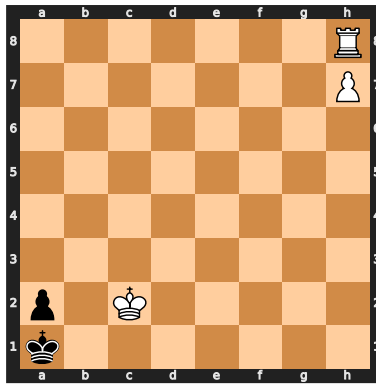
Three valid solutions were submitted, with the best two solutions using just five units. Interestingly, both of these solutions were identical to the setter's sample solution (up to reflection), and exploited the fact that a Rook and Pawn can mutually block each other's movement in opposite directions.



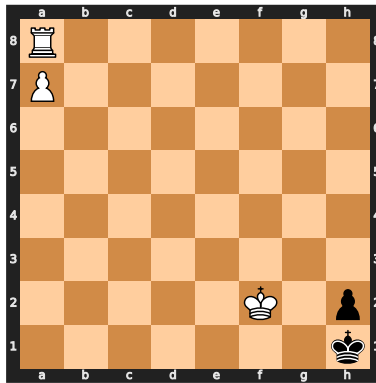
Challenge 13 | GM John Nunn | Score: 43
5KBk/5QN1/7N/p7/8/8/8



Challenge 13 | Alex Fletcher | Score: 45
7R/7P/8/8/8/8/p1K5/k7



Challenge 13 | Giles Body | Score: 45
7R/7P/8/8/8/8/p1K5/k7

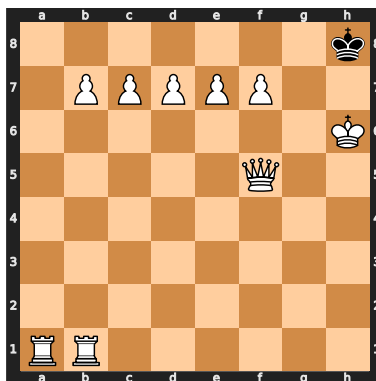


Challenge 13 | Sample solution (Tim Paulden) | Score: 45
R7/P7/8/8/8/8/5K1p/7k

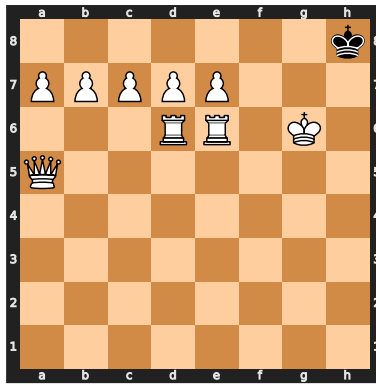
Challenge 14

White has exactly nine units (including the King) and can mate in one even if Black removes any seven of White's non-King units before White moves. (Note: The position is invalid if any of the possible removals would place Black in check.)

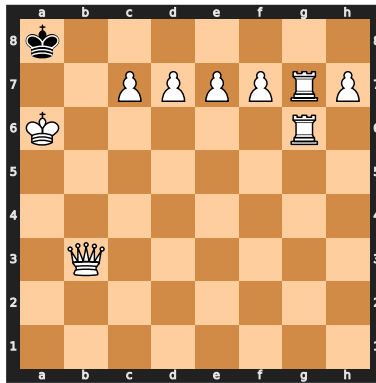
Several entrants realised that the conditions would be met by a position with multiple pawns on the seventh rank, and two or three major pieces behind:



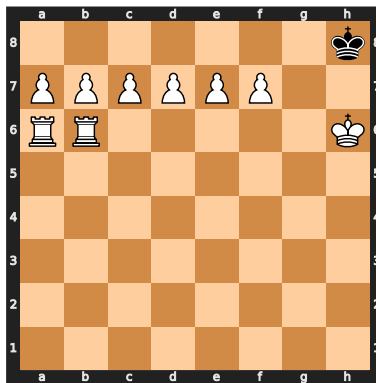
Challenge 14 | Alex Fletcher | Score: 40
7k/1PPPPP2/7K/5Q2/8/8/RR6



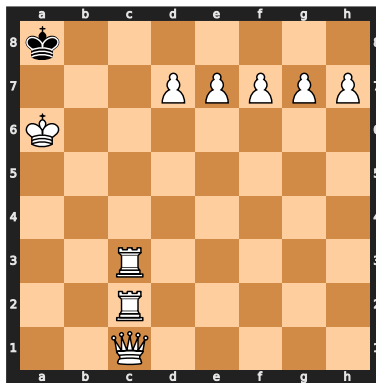
Challenge 14 | Ellis Manning | Score: 40
7k/PPPPP3/3RR1K1/Q7/8/8/8/8



Challenge 14 | John Bass | Score: 40
k7/2PPPPRP/K5R1/8/8/1Q6/8/8

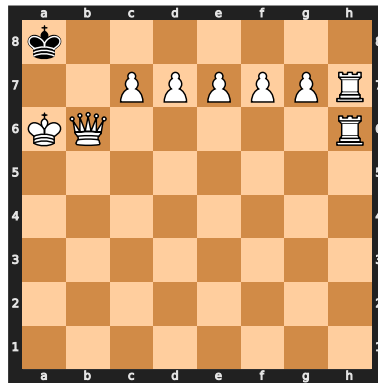


Challenge 14 | GM John Nunn | Score: 40
7k/PPPPPP2/RR5K/8/8/8/8/8



Challenge 14 | Sample solution (Tim Paulden) | Score: 40
k7/3PPPPP/K7/8/8/2R5/2R5/2Q5

Unfortunately, one position received a ten-point penalty for being retro-illegal (i.e. it could not have arisen in a legally played game) - specifically, the Black King must have just moved from b8, where it would have been in an impossible double-check:



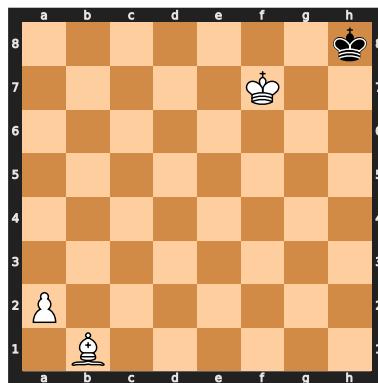
Challenge 14 | Mike Waddington | Score: 30 (Penalty: -10)
k7/2PPPPPR/KQ5R/8/8/8/8

Challenge 15

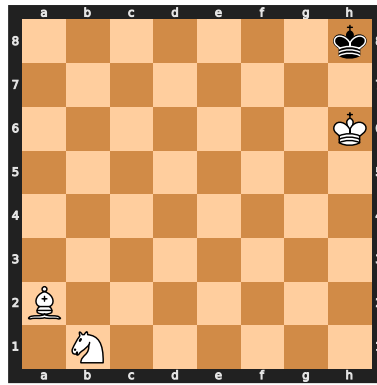
It can be deduced from the position alone that Black's previous move must have been K×h8.

In some sense, this was the trickiest and messiest of the challenges - and possibly the most controversial!

GM John Nunn was the 'challenge winner', as he was the only person to identify a four-unit solution, which was similar to the setter's sample solution (see below). In the first position (John's submission), the previous two moves must have been Ng6-h8+ by White and Kh7xh8 by Black, as otherwise Black's King would have been in an impossible check from White's Bishop when it stood on h7. Similarly, in the second position, the previous two moves must have been Nf7-h8+ and Kg8xh8.

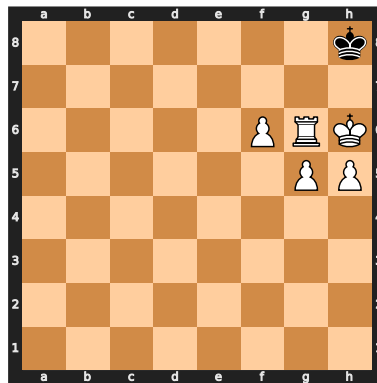


Challenge 15 | GM John Nunn | Score: 46
7k/5K2/8/8/8/8/P7/1B6



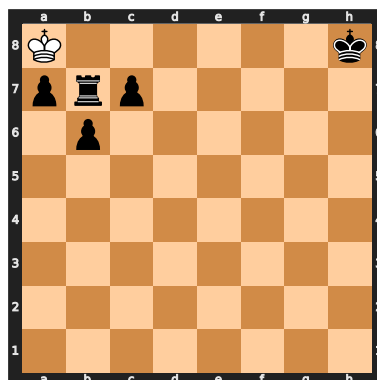
Challenge 15 | Sample solution (Tim Paulden) | Score: 46
7k/8/7K/8/8/B7/1N6

Another solver found a slightly less efficient six-unit solution (see below) in which Black must have just played Kg8xh8, because retracting the move Kg8-h8 instead gives a position in which Black's King is in an impossible check from the White Rook. (If one imagines shifting the Black King to f8, and adding a White Bishop at h8, the last few moves leading to the position in the diagram could have been Bg7+ Kg8 Bh8+ Kxh8.)



Challenge 15 | Ellis Manning | Score: 44
7k/8/5PRK/6PP/8/8/8/8

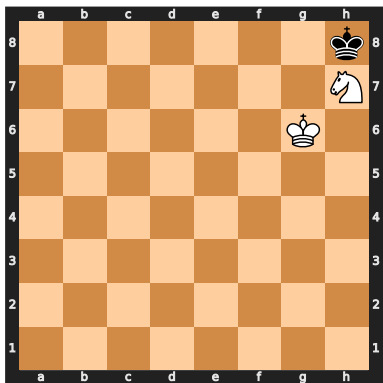
Unfortunately, the six-unit position submitted by our runner-up (see below) received a ten-point penalty for being retro-illegal (i.e. it could not have arisen in a legally played game). Specifically, White's King is unable to legally reach a8 while Black's Rook stands on b7, and conversely, Black's Rook is unable to legally reach b7 while White's King stands on a8.



Challenge 15 | Alex Fletcher | Score: 34 (Penalty: -10)
K6k/prp5/1p6/8/8/8/8/8

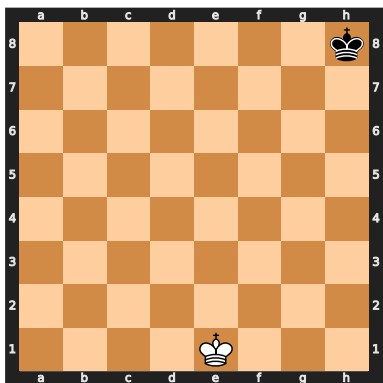
Finally, one entrant designed his position based on the principle that a chess game ends immediately once there is no possible sequence of moves that leads to checkmate for either side (an idea known as 'Dead Reckoning' in the problem literature - for details, see the tutorial at <http://anselan.com/tutorial.html>). Thus, in the position below, he argued that Black must have just captured a piece with Kg8xh8, otherwise the position would already

have been 'dead' due to insufficient material. Unfortunately, this isn't quite right in this case - the position would actually have been dead immediately before Black's capture, as the capture is Black's only legal move due to f8 being covered. (Interestingly, the position is almost identical to 'position B' at the link provided above.) In view of the slightly faulty execution of a clever idea, a three-point penalty was applied.



Challenge 15 | Luke Garner | Score: 44 (Penalty: -3)
7k/7N/6K1/8/8/8/8/8

In fact, based on the 'Dead Reckoning' principle, the two-unit position shown below (White King on e1 and Black King on h8, with White to move) is a valid solution to Challenge 15, because Black's King must have just captured a White Rook or White Queen on h8, and crucially, Black would have had the option whether or not to do so. For instance, White's last move might have been Rxh8 (capturing Black's h8 Rook with his own Rook), and the position would only become 'dead' when Black recaptures with Kxh8.

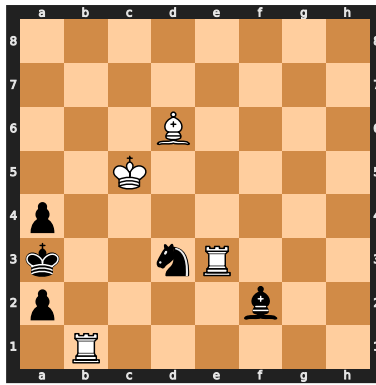


Challenge 15 | Sample solution with Dead Reckoning (Tim Paulden) | Score: 48
7k/8/8/8/8/8/8/4K3

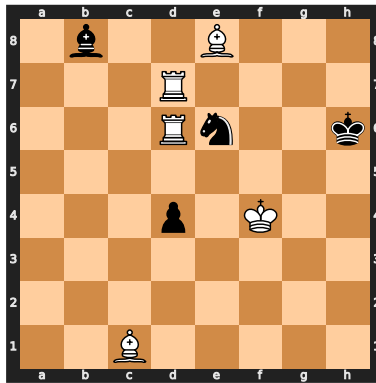
Challenge 16

White is in check and has exactly six legal moves – none of these moves is a capture, and all of them are mate in one.

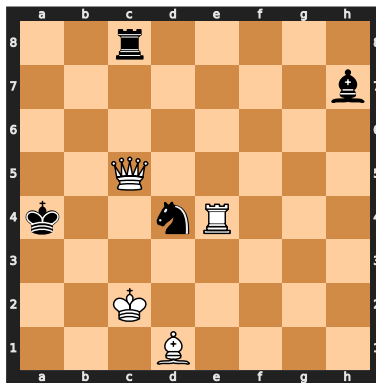
A tough cookie to round off the contest! Two entrants found a nine-unit position meeting the conditions (see below) - though an eight-unit solution (with multiple pinned pieces) does exist, as shown in the third diagram below.



Challenge 16 | Alex Fletcher | Score: 41
8/8/3B4/2K5/p7/k2nR3/p4b2/1R6



Challenge 16 | GM John Nunn | Score: 41
1b2B3/3R4/3Rn2k/8/3p1K2/8/8/2B5



Challenge 16 | Sample solution (Tim Paulden) | Score: 42
2r5/7b/8/2Q5/k2nR3/8/2K5/3B4