UNIVERSITY OF WISCONSIN
PLATTEVILLE
DEPARTMENT OF MATHEMATICS

Problem of the Week #9

(Spring 2023)

UWPACS, the UW-Platteville Armageddon Chess Squad, needs to get ready for the new season by ranking its eight players. They don't have much time before they have to submit their rosters, with their players in order from strongest to weakest, and unfortunately they only have one chess clock, so they can't play more than one game at a time. The good news is that Armageddon chess can't end in a draw*, and the games don't take nearly as long as ordinary competitive chess: they're always over in ten minutes or less.

Because they're in a hurry, the coaches have decided to assume that game results really tell you how good the players are — there are never any upsets — and that therefore, if player A beats player B and B beats C, we know for sure that A is better than both B and C (and B is better than C).

1. If the team has a three-hour meeting in which to play games, and the coaches pick the players for each game as they go along, can they get enough information to determine a ranking of all eight players?

2. What if the team only has two and a half hours to get the ranking done?

[You should submit your solution even if you only answer one of these two questions!]

[Please fully explain your answer.]

Email solutions to `kwonmi@uwplatt.edu` by 2:00pm on Wednesday, April 5, 2023.

Every week, the best solution submitted earns a $10 Platteville gift certificate; the top scorer each semester also wins a cash award. Good luck!

You can always see the Problem of the Week (and complete rules) online at:

`http://uwpmath.weebly.com/`

*Stalemate is treated as a win for Black.