

Nederlandse Wiskunde Olympiade voor Bedrijven



Friday, 26 January 2018

- Available time: 20 minutes.
- For this “uitsmijter” only an answer is required, no calculation or proof. A correct and complete answer is worth 10 points. For an answer that is not complete or not completely correct you may also get some points.
- Formula sheets and calculators are not allowed. You can only use a pen, compass, ruler or set square and of course your mental skills.
- Good luck!

For the contest managers: Score first round: Score uitsmijter:

Name:

Company:

Uitsmijter

In a tournament in which n players compete, every player plays a match against each of the other players. In every match the winner is awarded 1 point and the loser 0 points, and in case of a tie each player is awarded half a point. At the end of the tournament a ranking is published based on the total number of points that each player has gained.

- The administrator of the tournament adds all the total scores of the players together, but accidentally he skips one player. He calculates a total number of 190 points. Determine all possible values of n for which this may happen.
- At a different tournament it turns out that every player gained exactly half of his points in matches against the ten players that end up with the lowest total scores. (In particular, each of the ten players with the lowest total scores has gained exactly half of his points in matches against the other nine of the ten.) Determine all possible values of n for which this may happen.

Answer:

(a)

(b)