

# Nederlandse Wiskunde Olympiade voor Bedrijven



Friday, 2 February 2024

- Available time: 20 minutes.
- For this “uitsmijter” only an answer is required, no calculation or proof. In each problem, only a correct and complete answer is worth points. In total 10 points can be achieved.
- All answers should be given in exact form, like  $\frac{11}{81}$ ,  $2 + \frac{1}{2}\sqrt{5}$ ,  $\frac{1}{4}\pi + 1$ .
- All answers should be a single number. Work out expressions, for example 243 instead of  $3^5$ .
- 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: \_\_\_\_\_

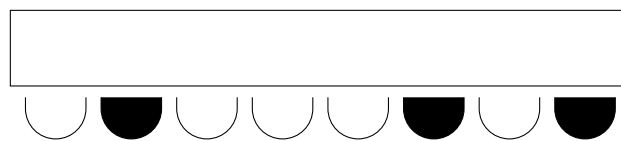
Name:

Company:

## Uitsmijter

A company organises three practice sessions for the Math Olympiad for Companies.

- a) The first practice session is held in a room with a long table with eight chairs. All chairs are next to each other, all at the same side of the table. Only one team of three is participating in this practice session. To prevent them from seeing each other's answers, one or more chairs should be kept empty between each pair of participants. In the figure below, a possible choice of chairs is depicted.



In how many ways can the chairs be chosen? Note: only the choice of the chairs matters; it does not matter how the participants are distributed over the chairs.

Answer: \_\_\_\_\_

- b) In the second session, a second team is also present. So there are six people in total now. In this session a long table is used with sixteen chairs next to each other. In how many ways can the six chairs be chosen? Again one or more chairs should be kept empty between each pair of participants, regardless of whether they are on the same team.

Answer: \_\_\_\_\_

c) Both teams are also present at the third session. Now they use a wide table with eight chairs at each side. Team A is seated on the left side of the table; team B is seated on the right side.

The participants are not allowed to sit next to or directly opposite each other. In the figure on the right, a possible choice of chairs is depicted.

In how many ways can the chairs be chosen, so that team A is seated on left side of the table, team B is seated on the right side, and no participants are next to or directly opposite each other?

Answer:

